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THE UNIVERSITY OF ALBERTA

WIND INSTRUMENT SOUND AS A NEXUS FOR COMMUNICATION WITH AUTISTIC CHILDREN

BY

© PAUL DAVID HOELZLEY

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF SECONDARY EDUCATION

EDMONTON, ALBERTA
FALL, 1986

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ISBN 0-315-32591-7

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(External Examiner)

Date August 1, 1986

DEDICATED TO MY FATHER (deceased October 1, 1970)

AND MOTHER

PAUL T. AND FLORENCE HOELZLEY

BOTH OF WHOM IMPARTED TO ME THE GREATEST GIFT, LOVE; AND THE GREATEST LESSON, "TRUST IN THE LORD WITH ALL YOUR HEART; AND LEAN NOT ON YOUR OWN UNDERSTANDING. IN ALL YOUR WAYS ACKNOWLEDGE HIM, AND HE SHALL DIRECT YOUR PATHS."

Proverbs 3:5-6

ABSTRACT

The present study sought to open up channels of communicative contact with three autistic girls through the audition of eight different wind instruments. The purpose of the study was to investigate the potential of wind instrument sound as a communicative nexus between the children and myself. Three autistic girls from the Edmonton area were studied in their homes and in their school, from February through May, 1986. Background data relative to the school and the three children involved in the study, as well as data from teacher-questionnaires and parental-interviews were collected prior to the actual music sessions with the children. Audition of the wind instruments took place in three different settings. In the first setting, the child sat directly in front of me as I played the instruments. No one else was present in the room. In other music sessions, I played the instruments from behind a screen as the children interacted with teachers and other student in the classroom. A final music session took place in a home in the presence of the child's mother. The study was guided throughout by a qualitative research methodology. Observational data consisted of recorded notes taken during my roles as participant-observer and participant-performer-observer. The children's responses and reactions to the musical sound stimuli were studiously observed and stringently described in the field note journal. Immediate observable responses were also recorded on the Observable Response Chart. Responses and comments from those who observed the musical sessions

are presented at the conclusion of the dissertation. The present study was premised on the assumption that there exists in each one of us an internal sound identity, a preferential sound which characterizes and identifies us. This individual sound preference is identified by many experts as the ISO sound principle. In this study, the musical-sound stimuli of eight wind instruments were employed to discover the ISO sound identity of the three autistic children. The process of discovering each child's ISO sound identity unfolded at three levels: the diagnostic level, the therapeutic level, and the educative level. At the diagnostic level the objective was to discover the instrumental sound which best coincided with the child's ISO sound identity. To discover a sound which would evoke a response from the child, be it only a gesture, a smile, the emitting of an imitative sound, or an increased span of attention, would be to discover a parameter of that child's ISO sound identity. The therapeutic and educative levels of the study unfolded concurrently. The instrumental sounds found earlier to be empathetic with the children's ISO sound identities were then employed therapeutically to draw the children into deeper interpersonal relationships and more meaningful communicative contact with their environment. The educative level of the study sought to use instrumental sound stimuli as a means of extending the children's attention spans, to increase the awareness of cause-and-effect relationships, to open up simultaneous avenues of auditory, visual, and tactile modalities of sensory stimulation, to enable the childen to engage in gross and fine motor activity, and to increase the childen's levels of enjoyment, pleasure and satisfaction.

Finally, the study concluded that wind instrument sounds, with the inherent tonal qualities of timbre, pitch and intensity resident in those sounds, have the potential to penetrate the walls of resistance often erected by autistic children. It was also concluded that 'live' wind instrument performance, in a setting familiar and unthreatening, can be used as an approach technique to both therapy and education in pursuit of a nexus for comunication with autistic children.

ACKNOWLEDGEMENTS

I wish to express my deep appreciation to the many people who have given support through the various stages of my doctoral program. I extend special thanks to my supervisor, Dr. R. Ware, for his understanding, encouragement and enduring support throughout each phase of the study. I wish also to express my gratitude to Dr. J. Parsons, for his personal interest and help in the study from beginning to end. The helpful comments and scholarly suggestions from Drs. L. Beauchamp, J. Jagodzinski, F. Pier, and A. Smith, are sincerely appreciated. Dr. N. Browne, External Examiner, whose sensitive questions reflected her appreciation for music therapy as it relates to childhood autism, is deserving of my gratitude and my respect.

I must acknowledge my indebtedness to Mr. John Nickel, and National Music of Edmonton, for supplying the wind instruments employed in the study. It was a pleasure to work with Mrs. Dora Reimer, who so faithfully read and typed the original manuscript of the dissertation.

I would be remiss if I did not express my appreciation to the children who were involved in the study. Although they remain anonymous, to me they are wonderfully known, appreciated and loved. I am deeply indebted too, to their parents, and to the school administration and staff, all of whom helped to make this study possible.

Finally, I wish to thank my family for their love and understanding. I wish to lovingly thank my wife Ilana, whose abiding

support was a constant source of inspiration, and whose added work responsibilities while I was a student, did nothing to diminish her loving dedication and commitment as a wife and mother. Thanks, too, to my children, David, Ana Gloria, Tim, Stephen, Laura, Lisa, Pamela and Amanda, for tolerating my preoccupation with the study, and who gave up many hours of fun-time family interaction. The loving promises of God and enduring family love sustained me at all times.

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CHAPTER I

INTRODUCTION

Background to the Study

Throughout history music has been one of the most satisfying and dynamic activities of humankind. It has always been an essential function of human beings. Music is unique and powerful in its influence on the human psyche primarily because of its unique sensory appeal, but also because it communicates. Music is non-verbal communication, articulating and expressing what other forms of communication cannot set forth. Music speaks what is unspeakable. It appeals to those emotions that draw individuals out of themselves and frequently draws them together and fosters social interaction and communication. It is the aspect of communication through music to which this study will address itself. The purpose of this study will be to investigate the potential of wind instrument sound, with all its concomitant properties of musical tone, as a means of opening up channels of communication with autistic children.

Human behavior involved with music has been studied by psychologists, anthropologists, and sociologists, as well as those in other disciplines. As a form of behavior, music is unique and powerful in its influence on handicapped and ill persons. It is often used as a dynamic means of persuasion for these persons to acquire new or better behavior (Gaston, 1968, p.7). Music has the power to open up channels of communication with mentally ill persons because it contains suggestive, persuasive, even compelling elements (Alvin, 1975, p. 6).

To the mentally retarded child music can take on very special significance. It can be the means, often the only means, by which a retarded child gains self esteem, learns to communicate, finds self expression, or learns to become socially involved.

"Music has been used as a persuasive tool throughout the history of mankind. One of its basic functions is to sway feelings " (Radocy, 1979, p. 189). Because music can be such a dynamic means of persuasion, it has almost limitless possibilities as a therapeutic and educative tool in the lives of the mentally retarded. Music's therapeutic power is noted by many researchers (Alvin, 1975; Benenzon, 1981; Despert, 1947; Gaston, 1968; Kanner, 1944; Michel, 1981; Sherwin, 1953). Music's powers lie in its own ability to unobtrusively infiltrate the lives of those mentally handicapped children who may have retreated from the outside world into a prison of darkness, loneliness, and despair. It is my belief that music can be the means through which a shaft of light can penetrate the imprisoned minds of these youngsters, bringing with it a bit of the joy, the happiness, and the wonder of the outside world from which they have withdrawn.

The autistic child is no exception. Although autistic children do not respond as readily to music as do other children with language-communication disorders, music is one of the important essential activities to promote social behavior and peer interaction

(Oppenheim, 1974, p. 45). Music has had many positive therapeutic influences on autistic children and many case studies strongly indicate that music does have an important part to play in the lives of these children (Michel, 1976, p. 53). Rimland (1964) asserts that musical interest and/or ability is "almost" universal in autistic children. Benenzon (1982, p. 12), posits that music as therapy should be the first approach technique for the autistic child because its non-verbal context makes it possible for these children to establish channels of communication.

Benenzon, in his work in South America, has found that musical sound is capable of crossing barriers in autistic children that are unsurmountable to visual, tactile and other sensual stimuli. Realizing that autistic children communicate using non-verbal means, musical sound was used to establish communication links with these children based on non-verbal (musical sound) foundations.

I believe that through the audition of wind instrument sound with the different tonal attributes of timbre, pitch and intensity accompanying each instrument, an instrumental sound can be isolated that best empathizes with an autistic child's internal sound indentity. Furthermore, this instrument can be used as a nexus or link to establish channels of communication with that child.

Purpose of the Study

The purpose of this study is to investigate the potential of wind instrument sound as a nexus for communication with autistic children.

The process of finding this potential is threefold:

1. Diagnostic
2. Therapeutic
3. Educative

> "While most autistic children behave as though other people do not exist, do not come when they are called, do not listen if you speak to them, rarely look you in the face, will try to pull away if you touch them or will walk right past you without pausing in their stride; most autistic children will respond to adults who can break through the barriers that these handicaps create" (Wing, 1980).

One way of breaking down these barriers of communication is through an intermediary object. In the case of this study, this intermediary object would be a wind instrument. The essential auditory requirements of rewarding expressive or receptive musical activity include the capacity to perceive tones and tonal relationships [Hanson (1942) cited by Critchley and Henson (1977, p. 4)]. However, perception of the specific acoustical properties of musical tone such as timbre (tone color), pitch, duration and intensity require little or no musical sophistication or "know-how."

The sensuous effect of tone color (timbre) needs no musical sophistication or education to produce a pleasurable effect on the individual. Because tone color is a non-rhythmical, purely sensuous element of music that produces (in the listener) pleasurable, non-intellectual impressions, listeners do not erect a defense mechanism against it (Alvin, 1975, p. 64).

Diagnostic Level

At the first level of testing, the goal will be to diagnose the child's internal sound identity, a sound empathetic to his/her ISO sound principle. The ISO (Greek=same or equal) sound principle (Benenzon, 1981, p. 33) is based on the premise that there exists in each person an internal sound identity. This sound preference individualizes us and draws us to that particular preferential sound. Therapeutically, this sound is the sum total of all our sound archetypes, our intrauterine and gestational sound experiences, and our sound experiences from birth and infancy up to the present moment (Benenzon, 1982, p. 5).

Altshuler (1948) found that depressed patients were stimulated more quickly with sad, melancholy music than with quick tempoed, lively music. Manic patients, whose mental tempo is quicker and livelier, were stimulated more rapidly with allegro, faster tempoed music than with the slower. Beginning with these observations, Altshuler gradually elaborated the concept of the ISO principle as fundamental to the practice of music therapy.

Dr. Anne Donnellan stated, at the National Conference on Autism in Winnipeg, Manitoba in May, 1984, that "any behavior is a form of communication." To find a sound that is empathetic to the ISO principle, then, can best be exemplified by saying that when a musical instrument has produced a sound which opens up a channel of communication, be it only a gesture or a smile between the autistic child and the researcher performing on that instrument, that particular musical sound has in some way coincided with that child's ISO sound principle. Having found the right instrument which can be used to open up communication with the child, verifies hypotheses about the capacity of musical sound to break through the autistic shell and completes the diagnostic phase of the testing.

Therapeutic Level

The second level of testing will be therapeutic in nature. Having found a preferential sound, the ISO sound principle, the next objective will be to touch the tender emotions of the child through the music, thus helping influence desirable responses from him/her. At this level, passive or receptive music therapy technique will be used. Passive music therapy means that the child is given no instructions but simply attends to the music (Aten, 1953; Benenzon, 1982). Using the wind instrument as an intermediary object between the child and myself, I will take advantage of this level of communication and attempt to further open up communication channels and establish interpersonal relationships. Hopefully a stronger relationship between the child and myself will develop. A further step would be to help integrate the child into his/her social environment.

Educative Level

The third phase of the study will be educative in its thrust and will try to involve the student in open communication by speaking, imitating sounds emitted by the instrument, matching pitches, singing or humming melodies which I will execute on the instrument, manipulating the keys or valves of the instrument as I play, or an attempt to blow the instrument him/herself. To get the child to respond to these modes of activity enables him/her to experience tactile, auditory and visual sensory stimulation as well as engage in gross and fine motor movement.

I was successful in achieving each of these three levels of the testing process as well as meeting a number of these objectives in each phase of the testing in a pilot study done in June, 1985, (see - Pilot Study, Chapter III).

The Questions

Pursuant to the purpose of this study, the following questions will be addressed:

1. Can wind instrument sound, with its concomitant properties of musical tone, i.e., timbre, pitch, intensity be used as a nexus for communication with autistic children?

2. What wind instrument(s) can best be used to uncover and

relate to the child's ISO sound identity?

Assumptions of the Study

This study was grounded on a number of assumptions. The assumptions presented herein are those which were identified in the very early stages of the research proposal and were maintained throughout each phase of the study. These assumptions are described below.

1. Many experts (Altshuler, 1948; Alvin, 1975; Benenzon, 1982; Critchley, Henson, 1980; Grebe, 1977; Schneider, 1957) postulate the existence of the ISO sound principle. It is neither the purpose nor the intent of this study to prove the veracity of their assertions. However, a major assumption of this study is premised on the belief that the ISO sound principle does exist and from it springs an internal preferential sound identity which, if discovered through the sounds of the wind instruments employed in this study, can open up channels of communicaton with autistic children.

2. Autistic children are often totally oblivious to their environment. They sometimes appear blind when they can see and appear deaf when they can hear. An assumption of this study is that any response or reaction to a sound produced on the wind instruments used in the study, be it only a gesture, a smile, an increased attentiveness, a glance, or the emittance of a sound, can be construed to be a communicative breakthrough.

Should a sound be discovered which coincides or empathizes in some way with the ISO sound principle of an autistic child, it is assumed that that particular sound can evoke a response or reaction which will enable the opening of channels of communication with that child.

3. It is further assumed that the sounds from the wind instruments employed in the study can be used as therapeutic and educative tools leading to gains in communication, education, pleasure and enjoyment for the children involved in the study. Some of these assumed gains are described as follows:

a) The sounds of the instruments can be used as an attention-getting device.

b) A sound empathetic to a child's ISO sound can be used to increase the child's attention span.

c) The simultaneous presentation of visual and auditory stimuli from the instruments can increase the child's awareness of cause-and-effect relationships.

d) The sound(s) of an instrument which coincides with a child's ISO sound can induce in the child a tendency to vocally imitate that sound or set of sounds.

e) The music produced on the instruments can bring some degree of pleasure to the children through the establishing of interpersonal relationships, the sensory pleasure of sound, the joy of touching and/or seeing a musical instrument, the experience of physically responding to rhythm.

4. The foregoing assumptions are based on the belief that the study warranted a qualitative research methodology. The assumption that the best way to learn about and understand autistic children is to observe them and participate with them in settings that are natural and familiar to them, was the guiding principle throughout the length of the study. Rather than applying predefined sets of variables or manipulating the children and/or their environment, or testing them in the artificial setting of the laboratory, this study will allow for the spontaneous emergence and blending of that which is known and that which is becoming known in an environment familiar and natural to these children.

Significance of the Study

The stated purpose of this study is to examine the potential of wind instrument sound as a nexus for communication with autistic children. It has been said that music can help autistic children increase communicative contact with others (Michel, 1976, p. 53), and interest and/or ability in music is almost universal in autistic children (Rimland, 1964). Although new musical treatments are being implemented both therapeutically and educationally, some with positive results, the researcher has found little in the literature where wind instrument sound has been utilized to establish links of communication with language and communication disabled children.

Benenzon, (1981, p. 6) has said that musical sound stimuli may trigger organic and psychological expressions of the dynamics of humans that enable us to find out more about how they function and that these types of sound stimuli are often stronger than tactile or visual ones. Although autistic children often resist visual, tactile and other attempts at using sensory stimuli to open up channels of communication, they do respond to music and are affected by it. Musical sounds penetrate into the subconscious and cannot be resisted (Alvin, 1965, p. 97).

Given the infinite variety of wind instrument sound with all its appealing components of pitch, intensity and timbre coupled with the energizing and organizing forces of rhythm and melody capable of being produced on these instruments, it is surprising that the sound parameters of wind instruments have not been more fully exploited in the fields of special education and music therapy. The uniqueness of this study is evident from the gaps left in other research studies reported in the literature. Most testing with musical sound seems to be done electronically, or with one instrument played by the researcher, such as the piano (Nordoff and Robbins, 1971). Juliette Alvin has experienced much success with the cello (See Alvin, 1965). Although wind instruments have been used in music therapy sessions with autistic children (Michel, 1976, p. 39), it appears that none have fully exploited the tonal property of timbre (tone color) as a link for communication with autistic children. This study will attempt to fill those gaps by using not one but eight different wind instruments with their many and varied pitch ranges, intensity levels and tone qualities. The added variety of instrumental sound will help find the instrument whose sound quality best empathizes with the internal sound identity (ISO principle) of the child. According to Benenzon (1982), we should not think of too rigid an ISO. Perhaps the tone quality of more than one instrument will coincide with the child's internal sound identity.

Adding to the uniqueness of this study will be the absence of the artificial and contrived setting of the laboratory. The audition of these instruments will be in the natural setting of the child. I will play the instruments for the children as a participant-performer-observer in their own familiar environment.

The significance of the study is further enhanced in that it cultivates an alternative methodological epistemology to the dominant quantitative "scientific" paradigm. The study will deal with autistic children in a setting natural to them, in their homes and in their own school. Because autistic children resist even minute changes to their environment and often seem to be obsessed with maintaining sameness in their environment (Gilliam, 1968; Kanner, 1944; Rutter, 1984), the artificial and contrived setting of the laboratory, or experimental and control group testing would make these modes of testing extraordinarily difficult with autistic children.

The paradigmatic significance of this study, is that an alternative epistemology has been sought out. A qualitative methodology will be used wherein I will participate with the children involved in their own natural setting. I will use naturalistic observation techniques which neither define relevant outputs _a priori_ nor consciously alter the research environment prior to contact with the phenomena. Naturalistic methodology implies an emergent research design and a dialectical relationship between discovery and verification [Guba (1978) cited by Donmoyer (1979)].

The nature of the value of this study is also significant in that it reflects my own philosophical-axiological orientation toward research involving human beings. That orientation is deontological in nature. Although I believe strongly that there will be utilitarian value and extrinsic worth derived from the study, the underlying principle for this research study is not teleologically oriented nor is it pragmatic. My deontological orientation looks to the intrinsic good in the act of research dealing with human beings in need simply because human beings, especially those who are incapable of helping themselves, are due any and all efforts at helping them improve their lives.

My orientation does not preclude an interest in results. It is my belief that the principled practice of doing that which is intrinsically good will, in the end, result in the most good being done. I want to open channels of communication with autistic children for whom communication has previously been impossible.

Although research on autistic children is rarely replicated (Balow, 1981, p. 246), the possibilities of additivity, of other studies logically growing out of and building on this proposal, are numerous. Should wind instrument sound be found to be a link that opens up communication with autistic children, other studies can then expand to the infinite variety of other instrumental sounds including other wind instruments, the stringed instruments and those of the percussion family. Entirely new programs of music therapy and special music education for autistic children could then be implemented, focusing on the wonder and beauty of instrumental sound.

Finally, personal interest adds to the importance of this study. I have an extensive background in music performance and music education which was gained in four countries. I play all eight wind instruments to be used in the study and I have a love for and rapport with children. The combining of these factors insure a deep personal meaning and significance for me as the researcher.

Definition of Terms:

Ad Libitum:

(Latin = at liberty) At liberty to play freely and spontaneously.

Arpeggio:

Successive notes of a chord (C E G) sounded separately rather than simultaneously.

Autism:

Autism is used in psychiatry to mean withdrawn and self-absorbed. The term comes from the Greek word 'autos,' meaning 'self' (Wing, 1980).

Autism is a severe life-long developmental and learning disability which is defined and diagnosed behaviorally and primarily characterized by the inability or limited ability to develop abstract concepts, or use or understand language as a means of communication. These problems are due to a physical dysfunction within the brain, the exact nature of which is as yet unknown. The condition may occur alone or in association with other disorders. (From Edmonton Autism Society, April, 1985).

Characteristics of Autism:

The syndrome (or set of symptoms) defining autism was first described by Leo Kanner in 1943. It is generally characterized by:

a. Healthy, intelligent and attractive appearance.

b. Abnormal reactions to sensations and noises, inability to perceive ideas or methods in the usual manner, preference for touch, taste and smell.

c. Difficulties with speech and communication, inability to grasp words or concepts, echolalia.

d. Withdrawn, apathetic and unresponsive, inability to understand or express normal human feelings and emotions.

e. Resistance to even minute change in surroundings or lifestyle.

f. Disinterest in people, unusual interest in inanimate objects.

g. Frustration, hyperactivity or hypoactivity.

h. Abnormal body movements and mannerisms such as rocking, waving, whirling, head knocking, tantrums. (From Edmonton Autism Society)

Echolalia:

Echolalia is the precise repeating of words, phrases, sentences, and questions. This repetition may be immediate or delayed. Immediate echolalia is the precise repetition of what has just been heard. Delayed echolalia is when a child repeats in a seemingly irrelevant situation a word, phrase, or sentence which he/she has heard at one time or another (Morgan, 1981).

Intermediary Object:

An intermediary object is a communication tool capable of acting therapeutically on the patient by means of a relationship without the onset states of intense alarm (Benenzon, 1981, p. 37).

Interval:

Intervals are the successive sounding of two or more tones of different pitch (frequency).

ISO Sound Principle:

ISO (Greek = equal, same) in music therapy is music that corresponds with the prevailing mood of the patient (Critchley, Henson, 1980, p. 436).

ISO means equal. The concept sums up the notion of the existence of a sound or set of sounds or internal sound phenomena that characterize and individualize us.

The concept is best exemplified by saying that to produce a channel of communication between a therapist and a patient the mental time of the patient is coinciding with the sound and musical time executed by the music therapist (Benenzon, 1981, p. 33).

ISO sound principle, ISO sound identity, ISO, ISO principle, preferential sound, internal sound identity, sound-rhythm traits, are used synonymously in this study.

Music Therapy:

The controlled use of music to restore, maintain and/or improve mental and/or physical health.

Principles of Music Therapy:

1. the establishment or reestablishment of interpersonal relationships
2. the bringing about of self esteem, through self actualization
3. the utilization of the unique potential of rhythm to energize and bring order (Gaston, 1968, p. 5).

Properties of Sound:

1. Duration: Duration is the time element in music producing sounds of different length (Alvin, 1975, p. 66).
2. Intensity: Intensity refers to the degree of loudness of a sound. It is measured physically in terms of power units of electrical energy called decibels (db). The dynamic level of intensity is translated psychologically (subjectively) in terms of loudness.

3. Pitch: Pitch is defined herein as the sensation resulting from relative placement of sound on a high-low continuum (Radocy, Boyle, 1979, p. 14). Pitch is measured physically by frequency of vibrations per second (Hz). Frequency is translated subjectively as pitch (highness or lowness of tone).

4. Timbre: Timbre (French=Tone color, tone quality) is the tonal attribute that distinguishes sounds that are otherwise identical in pitch, loudness and duration (Radocy, Boyle, 1979, p. 53). Timbre is the actual description of the quality of any tone (Seashore, 1938, p. 21).

Self-Stimulation:

Self-stimulation is the engagement in ritualistic, repetitious activity for long periods of time (Morgan, 1981). The most typical stereotypic actions of the autistic child are hand-flapping, rocking, oscillating of the arms, strange posturing of the hands or fingers, spinning of the body like a top, darting and lunging in staccato fashion, toe-walking, and head-banging.

Staccato:

Staccato means to separate or detach successive sounding pitches.

Organization of the Dissertation

The dissertation is organized in five chapters. The initial chapter presents the background and purpose of the study, followed by a second chapter which outlines related literature pertinent to music therapy, music education, and childhood autism.

The third chapter describes the research methodology, the data collection strategies, and the pilot study. The musical notation of the register (compass) of the eight wind instruments employed in the study is also presented. A presentation of the data collected from teacher-questionnaires, parental-interviews, and the observational phases of the study constitute the fourth chapter.

The final chapter covers interpretation and discussion of the data abstracted from the various data collecting strategies and draws some conclusions and recommendations for the consideration of other researchers in this field.

Summary

This chapter has set forth the background, the purpose, the assumptions, and the significance of the study. The fact that music has been used throughout history as a dynamic means of persuasion and influence in the lives of human beings led to the present study dealing with autistic children and music. The underlying assumptions, the stated purpose and the significance of the study are all premised on the belief that wind instrument sound can be used to establish a communicative nexus between myself and the children involved in the study, and that this newly established link of communication can enrich their lives.

CHAPTER II

REVIEW OF RELATED LITERATURE

Music Therapy in History

The use of music as a curative power seems to be as old as music itself. Gaston (1968) has said that the persuasive power of music has been used in every culture known to man and has always been a dynamic and powerful means of influencing human behavior. Authors appear to agree that the first mention of music as a curative power is the Old Testament account of David playing his harp for King Saul.

In this story, music was used as therapy to relieve what was apparently a neurotic depression. David was one of the first musicians to be called upon to use his musical skill to treat a person affected by a mental disorder.

> Saul's attendants said to him ... "Let our lord command his servants here to search for someone who can play the harp. He will play when the evil spirit from God comes upon you and you will feel better." (I Samuel 16:15, 16)

It would be safe to assume that music as a curative power over the spirit was a proven practice before Saul's attendants called for David and his harp. Saul's servants spoke positively and unequivocally about the results of David's harp playing; " ... he will play and you will feel better." There was no question that the outcome would be anything but positive. The advice given Saul by his helpers implies the historic belief in the power of music over the spirit. David was thus brought before the King to play his music and music as a therapy for the mentally affected person was forever recorded.

> Whenever the Spirit from God came upon Saul, David would take his harp and play. Then relief would come to Saul and he would feel better, and the evil spirit would leave him. (I Samuel 16:23)

There are numerous other references in the Bible which, although not directly related to music as therapy, show the affective influence that music has with human emotion. Some of these references associate music with joy, praise, mirth, happiness, religious fervor, sorrow and lamenting. (See Genesis 31:27; Exodus 15:1, 20, 21; Judges 5:1-3; Psalm 68:28; Psalm 81:1-3; Psalm 150; Matthew 9:23; Matthew 11:17; Colossians 3:16).

Although the Biblical account of Saul and David is the first extant written account of the use of music as therapy, that account is pre-dated by Egyptian medical papyri dating back to 1500 B.C. These medical records refer to the favorable charms of music and its influence on the fertility of women. Papyri discovered in Kahum by Petric in 1899 offer the earliest written references to music, not as therapy but as an influence on the human body (Benenzon, 1981).

Primitive peoples frequently believed that every living being has its own secret sound or song which made it vulnerable to the magic spells of the witch doctor. Witch doctors often used their magic rites to discover the sound or song to which the sick individual would respond. Personal sound could be related to a person's voice or the timbre (tone color) of a certain instrument and was associated with the magic ISO principle (Alvin, 1984, p. 65). According to Benenzon (1982, p. 144), there exists an unconscious personal sound (similar to the one existing in some psychotics) which confirms the old belief that all people are born with their own personal internal sound to which they respond.

The Greeks were perhaps the precursors of modern day music therapists. They found music so important as a tool for aesthetic development, education and therapy that they felt music should be controlled by the state. Aristotle spoke of the use of music to control ungovernable emotions and saw music as having a beneficial effect leading to emotional catharsis. Plato describes music to fight off phobic fears and anxieties. "Music has not been given to man to please his senses but rather to calm the turmoil of his soul" (Benenzon, 1981).

Zarathustra recommended beginning and ending each day with musical concerts because the sweet and measured movement of music made the soul enter the silence of the senses and encouraged pure thought. Aurelianus reported that older people were cured through music, particularly if songs were sung over them so that the vibrations resulting from the percussions of the air would find the patient and relieve pain. Madness was cured during the time of Augustus by Zenocrates and Celsius by the use of certain instruments, perhaps through the use of an instrument whose timbre matched the personal sound of the patient.

These approaches by the Greeks are interesting in that they show the intuitive aspects of observation. The use of music as therapy by the Greeks, unlike their primitive predecessors, had no religious or magical connotations but seemed to be used clinically and observationally.

Schipkowensky (1961) posits that music in ancient Greece was given such a prominent role in fields of education, constructive interpersonal relations, art, religious ceremonies and public life because it was considered to be indispensable for the preservation of the mental and physical health of the individual and the cure of functional and even organic disease.

Greek, Hebrew and Arab writings of the past contain frequent mention of musicians being brought in to help alleviate pain. Influential leaders in the Islamic World who enriched themselves with knowledge of the culture from their Greek and Roman predecessors passed on their positive attitudes about music to the Occidental World (Ammar, 1965). This is why music was introduced into their mental hospitals, the latter being found in the Arab world at least four centuries before similar institutions in Christian Europe [Schipkowensky (1961) cited by Critchley and Henson (1977)].

The magical virtues of music have often been attributed to certain instruments. In Magia Naturalis by Gianbattista della Porta, an Italian naturalist of the sixteenth century, mention is made of making wind instruments of the wood of medicinal plants. della Porta suggests that sounds produced by these instruments would have the medicinal effect of the plants themselves. Poplar flutes, for example, would be good for Sciatica; those made of helibone, for nervous diseases; while a purging effect could be achieved through the medicinal-musical use of instruments made from the fibre of ricinus plants.

della Porta's use of instruments and their use in healing is, of course, pre-dated by the numerous references in Hebrew, Arabic and Greek writings. Whether used by the primitive or the modern player, the player has always identified him/herself with the instrument, considering it a prolongation of his/her own body. "The processes of manipulation of an instrument demands conscious control of movement in time and space and also transforms sound into psycho-motor impulses and liberates them, thus having significant therapeutic value" (Alvin, 1974).

In 1650, in his Musurgia Universalis, Father Athanasius Kircher expounds a musurgicoiatric magic. "If music cannot cure all diseases, at least it acts favorably on the ones originating in yellow bile and atrabile" (Benenzon, 1981). Also cited by Benenzon (1981), is a book entitled Memoire sur la Memoire de Guerir la Melancolie par la Musique, by Pierre Buchox, precursor of the ISO principle:

> The music to be used to cure dry, melancholy temperaments, should start with low tones and then insensibly rise to the higher tones: thanks to this harmonic graduation, the tense fibres used to different degrees of vibration gradually relax...Simple, pleasant and sonorous music should be used: this music agreeably tickles and enlivens spirit limph, dissolves liquids and makes them more mobile (p. 149).

Benenzon (1981) comments on this by saying that this text rather naively shows the "scientific" desire to give a clear and precise description of the mechanism whereby the physical aspect of audition affects the moral one.

In the nineteenth century, music was placed among the entertainments that distracted the patient from the sad and painful objects that disturbed and agitated him/her. Obliging the patient to fix his/her attention on music would alleviate the painful thoughts upon which he/she was meditating. Esquirol, a French psychiatrist living around 1800, found that music frequently distracted mentally affected patients from their painful meditation and was beneficial for convalescence. Esquirol comments,

> "I tried music as a means for curing the demented; I tried all types and in all sorts of ways and under the most appropriate circumstances for success. Sometimes it irritated to the point of fury, frequently it seemed to distract, but I cannot say it has contributed to cure. It has been beneficial for convalescence" (Benenzon, 1982, p. 149).

The Swiss doctor, Andre Tissot, differentiates between 'soothing music' and 'inciteful music.' His research suggests that music, although it could not eliminate the cause of pain, could at least make the patient forget about it temporarily (Benenzon, 1982).

Music as therapy has developed in this century as a profession. In many settings it is considered ancillary to medicine and psychology. The music therapist forms part of a team of doctors and psychologists whose concerted object is to help retain and/or restore the physical-mental health of the patient.

Many hospitals now carry music therapists on their staffs. Through the guiding offices of N.A.M.T. (The National Association of

Music Therapy) in the United States, many colleges and universities offer both undergraduate and graduate degrees in music therapy. According to Michel (1985), four universities in the United States offer doctorates in the field.

Music therapists have been employed in many public schools as well, as a result of the passage of federal Public Law 94-142, *The Education For All Handicapped Children Act* (United States Congress, 1975). Michel (1985) indicates that the passing of such a law stimulated considerably the use of music in special education because:

> "the Act encompassed all children, age three to twenty-one and encompassed children who are mentally retarded, multi-handicapped, deaf and hard of hearing, speech impaired, deaf-blind, orthopedically impaired, other health impaired, severely emotionally disturbed and specific learning disturbed" (p. 30).

The Canadian Association of Music Therapy was established in 1974. At this writing, one Canadian college offers a two year diploma course leading to music therapy registration with the Canadian Association for Music Therapy. Development in other countries is widespread with associations of music therapy appearing in Europe, South America, as well as Japan, Australia and New Zealand.

Throughout history, music has been used as a curative power whether in the magical rites and ceremonies of primitive tribes, in its reasonable and logical use in Greek culture or in its more current scientific setting. Music has been used as a means to transform or modify human behavior, to enrich human life and to draw humans into deeper interpersonal relationships and social activity. Music communicates.

The ISO Principle

"Sound," says Alfred Einstein (1936), "must have been to primitive man something incomprehensible and therefore mysterious and magical." Perhaps to ancient people, sound expressed mood that was a means of communication that carried with it an unmistakable identity. According to Alvin (1974), this phenomenon is observed in many parts of the world. Certain tribes in New Guinea believe that the voices of the spirits can be heard through the flutes, the drum and the bull roarer. Marius Schneider (vol. 1, pp. 1-12) tells us that, especially in totemic civilizations each one of the spirits in the world possessed its own personal sound. The imitation or simulation of that individual sound enabled the person to identify him/herself with an ancestor and thus maintain his/her life through contact (Alvin, 1974, p. 10).

Of particular interest to the music therapist is the process which leads to the identification of a certain person with a specific sound. Darwin believed that the effect of tone had biological roots. Left alone with several instruments which are easy to manipulate, a child will return to the same one time and time again showing a preference for the one whose tone most appeals to him (Alvin, 1974, p. 65).

The sensuous effect of tone color (timbre) requires no musical sophistication or education to produce a pleasurable effect on the individual. Tone color is one of the most significant elements of musical sound. Because of its associative power, it has deep psychological significance. To be able to find the timbre of an instrument (or voice) which produces the most pleasurable effect on the individual and which is in empathy with that individual's internal sound identity is to find an element of that person's ISO sound.

ISO in Greek means "the same" and in music therapy refers to the attempt by the music therapist to find that individualized sound which can be used as a communication link between therapist and patient.

Benenzon (1982) explains the ISO principle as follows:

> The ISO principle is based on the notion of the existence of an internal sound that is characteristic of each of us and individualizes us, a sound that is the sum total of our sound archetypes, our intrauterine and gestational sound experiences, and our sound experiences from birth and infancy up to the present moment. It is the sound structured within a sound mosaic, which is, in turn, built up over time and which is in perpetual movement. In simpler terms, the ISO principle can be described by saying that to produce a communication channel between the patient and the therapist, the mental tempo of the patient must coincide with the sound-music tempo played by the therapist. It (the ISO) is characteristic of the individual, it enables us to discover the channel of communication par excellence of the subject with whom we want to have a therapeutic relationship (p. 5).

Benenzon (1981, pp. 34-35), distinguishes the individual ISO with complementary ISO, group ISO and a universal ISO. He says that "complementary ISO's are the small changes that occur every day or every music therapy session because of environmental and dynamic circumstances." The complementary ISO is a momentary fluctuation of the individual ISO which is brought about by specific circumstances.

The group ISO is explained by Grebe (Benenzon, 1981, p. 35):

> Given its characteristics, the notion of group ISO aims directly at the concept of ethnic identity. A country of people with a complex culture contains a heterogeneous sum of cultural groups, sub-cultures of ethnic minorities, i.e. cultural parts of a whole. Although these groups share regional variations, they are basically distinguished from each other by biological (race), cultural (language) and geographic (region) indicators and each one of its members is characterized by an ethnic identity or affective autoidentification with the members of the group and consequently by a relatively frequent hostility towards strangers to the group. Therefore, cultural or ethnic identity is inseparable from sound (ISO) identity and depends both on the dynamic processes of learning of one's own culture and the stability or changes in cultural patterns.

Grebe (Benenzon, 1981, p. 35) has introduced what she calls a cultural ISO. She says,

> ... the cultural ISO is a product of the global cultural system of which the individual and his group form a part. It is the sound identity proper to a community of relative cultural homogeneity which responds to a musical culture or a sub-culture which is manifest and shared ... just as gestalt and complementary ISOs operate at individual levels depending on psychophysiological factors and musical development, group and cultural ISOs operate on collective levels and depend on social and cultural factors.

Benenzon's (1981) final concept is the universal ISO which is based on a sound identity:

> "that characterizes or identifies all human

> beings independently from their specific social, cultural, historical, and psychophysiological contexts. This universal ISO includes the specific characteristics of the heartbeat, the sound of inhaling and exhaling, the mother's voice during birth, and the first days of the infant (p. 36).

The present study does not concern itself with the group, universal, or the cultural ISO's introduced by Grebe. This study is concerned with discovery of the individual ISO sound identity only, but will take into consideration the complementary ISO due to fluctuation of environmental circumstances.

Music and the Handicapped Child

Music affects the body, the mind and the emotions. We see from history that music has always been used as a persuasive means of changing human behavior. Whether it be the sweet, sostenuto sounds of a tranquil melody to relax and quiet the troubled spirit or the incessant beating of drums accompanied by a cacophony of detached, punctuated staccato sounds to incite warriors to battle, the elements of music have been used as a powerful force to shape behavior. Alvin (1965) has said that handicapped children react to musical experiences exactly the same way normal children do. This being so, music, because of its ability to affect conduct, behavior and thinking, is an invaluable tool for rehabilitation and recovery in the lives of the handicapped.

Alvin (1965) suggests that children with handicaps react to music in four major ways:

> a) physically, b) sensuously, c) intellectually, and d) emotionally.
> a) Almost all children react instinctively to the impact of rhythm which provokes primitive, dynamic physical reactions.
> b) Many children are also sensitive to the sensuous effect of tone, a pleasurable sensory stimulation similar to the effect of certain color to the eye, or certain materials to the touch.
> c) Some children react intellectually. Their intelligence comes into action; they want to know, to understand, to remember, to discriminate. They may be interested in the structure of music; they have curiosity, but may not be emotionally involved.
> d) The child who is sensitive to the emotional impact of music finds in music an expression of feelings he has experienced and moods he knows. To him music is part of his world (p. 13).

It is my belief that in music, handicapped children may find love, security and movement. To these children, life, excitement, aggressiveness, sadness, calm, joy, and many other feelings can be identified with music.

Autism Defined

Autistic children were first defined as a special group by Professor Leo Kanner in 1943. Kanner suggested the name "early infantile autism" because the social aloofness, withdrawal and apparent absorption in self seemed to be the most important and prevalent character traits of these children. The word "autos" in Greek means 'self' and the word autism in psychiatry has been used to apply to those who are withdrawn and self-absorbed.

The National Society for Autistic Children defines autism as:

> a severely incapacitating lifelong development disability which typically appears during the first three years of life. It occurs in approximately five out of every 10,000 births and is four times more prevalent in boys than in girls. It has been found throughout the world in families of all racial, ethnic and social backgrounds. No known factors in the psychological environment of a child have been shown to cause autism (Washington, D.C., 1985).

Autism is caused by a physical dysfunction of the brain which severely affects the way sensory input is processed. This causes severe problems of learning, communication and in the establishing of social relationships.

Although more than forty years have transpired since Kanner first described autism, there are as yet no laboratory tests that can be used to diagnose autism (Attwood, 1983). Wing (1972) states that the underlying causes of autism are still unknown and that the possibility of their discovery seems as far away as ever. However, much progress has been made in the understanding of children affected with autism and also in ways of helping them acquire skills that will better help them to take a more meaningful place in society (Wing, 1972). Still, diagnosis is obtained primarily from a description of characteristic traits that, for the most part, have prevailed since Kanner's initial description in 1943.

Kanner redefined his diagnostic criteria in 1956. He stated that two symptoms must be present to indicate a diagnosis: extreme self isolation and the obsessive insistence on the preservation of sameness. Nevertheless, even though doctors and other professionals disagree on the number or character of symptoms needed to be present in order to formulate a diagnosis, there are four major criteria commonly used today:

1. Delay and abnormality in speech and language development
2. Severe impairmant of the development of interpersonal relationships
3. Ritualistic and compulsive phenomena
4. Onset in almost all cases before 30 months

(from Communication, December, 1983, p. 78)

According to Ritvo and Freeman (1981) the symptoms of autism are best explained as expressive of a physical dysfunction within the central nervous system (CNS) - the exact nature and type of which has yet to be determined.

The current concept of autism, its etiology, its treatment and its symptoms, is the result of numerous changes in view since the syndrome was first elaborated by Kanner in the early 1940's. The following quotations from Rutter (1979) delineate these changes.

> First, during the 1940's, Kanner's initial view of a constitutionally determined developmental disorder came to be replaced by the notion that autism was a psychosis, an early manifestation of schizphrenia. This was accompanied by the introduction of physical methods of treatment (such as electroconvulsive shock therapy) in some centres. However, the results were not good and these forms of intervention soon fell into dispute. The view that autism was a type of schizophrenia took longer to go but it is now generally accepted that there are so many differences between the two conditions that it is unhelpful to put them into the same category (Rutter, 1972). This has been reflected in the American Psychiatric Association (1980) DSM-III classification system in which

autism is termed a 'pervasive developmental disorder,' rather than as a psychosis.

The 1950's and early 1960's constituted the era of psychogenic theories in psychiatry as a whole; their application to autism centred on the hypothesis of the 'refrigerator' parent. The idea was that the parents were obsessive, cold and unfeeling, and that autism constituted a form of reaction or defence by the child against this noxious form of upbringing. The favoured mode of treatment was individual psychotherapy with the autistic child, removal from the supposedly damaging effects of the family, and social casework to change the parents and to help them recognize their role in the genesis of the child's condition. Once again, both the aetiological concept and the therapeutic approach then fell out of favour. Clinical experiences with psychotherapeutic methods were generally discouraging and systematic studies failed to demonstrate the hypothesized environmental abnormalities (Cantwell et al, 1978). The major reasons for the demise of psychogenic theories of autism, however, was not a lack of evidence in support but rather an increasing body of positive evidence that showed the validity of a different view of autism - that of a biologically determined developmental disorder that involves serious and pervasive cognitive deficits.

Current Concepts of Autism

As that view determines current methods of treatment, it is necessary to consider both what is meant by these concepts and also how good is the evidence that they are valid (Rutter, 1979a; 1983a). The concept involves four separate postulates: 1) that autistic children have cognitive deficits; 2) that these deficits involve deviant, as well as delayed, development; 3) that the cognitive deficits are basic to the condition and not just secondary features; and 4) that the deficits are biologically determined (Communication, March, 1984).

Research in autism is made more difficult because of its low incidence (about four to five per population of 10,000 as compared to forty cases of severe mental subnormality per 10,000 population, Wing, 1966). The assembling of any number of autistic children for testing is practically impossible outside of large metropolitan areas or special schools or institutions for autistic children. Nevertheless, much research is needed in etiological diagnosis, treatment, education and management. According to Balow (1981) "research has proven little, if anything, thus far regarding autism." Although it is beyond the scope of this study to deal with medical and psychological questions pertaining to autism, treatment, therapy and education are major concerns in this research endeavor. This study concurs with Oppennheim's (1974) stance that, "for autistic children, education is treatment."

Autistic Children and Music

One of the salient characteristic traits of autistic children is the lack of ability or desire to communicate. Speech and language are absent or delayed and autistic children have abnormal ways of communicating with others (Gilliam, 1981, p. 15). Verbal communication is almost non-existent. However, as Gaston (1968) points out, "Music is remarkably appropriate in many cases because it is non-verbal communication. Music engages the entire human organism in such a fashion that it may well be a most effective medium of intercourse between therapist and patient and patient and peers."

Indeed, Benenzon (1981, p. 121) posits that music should be the first approach technique with autistic children because it establishes channels of communication based on a non-verbal context. Rimland (1964) asserts that musical interest and/or ability is 'almost' universal in autistic children, an assertion maintained since 1943, when Kanner first defined autism as a special syndrome. Sherwin (1953) reports that Kanner, Despert and Rank generally found unusual musical ability and/or a unique reaction to music in autistic chldren.

According to Michel (1976), music as therapy has had many positive influences on autistic children. Many case studies strongly indicate that music does have an important part to play in the lives of these children (Gaston, 1968; Kanner, 1944; Michel, 1976; Sherwin, 1953). Oppenheim (1974) suggests that music is one of the important essential activities to promote social behavior and peer interaction. Because there is such a disturbance in the rate of communication skills, both cognitive and affective, devices must be found to draw these children out of themselves so as to enrich their lives through meaningful interaction with others. Mahler (1952, p. 302) states that because the child is most intolerant of human contact, the child "must be lured out of his autistic shell with all kinds of devices such as music, rhythmic activities and pleasurable stimulation of the sense organs."

Eugene L. Aten, in Psychiatric Concepts in Music Therapy for Children, shows a specialist's approach to the problem of music therapy with autistic children:

> With the autistic children it is necessary to use music in a strictly controlled situation because of their extreme sensitivity. Any direct

> attempt...meets with resistance, evasion and avoidance to the point that their fantasy life becomes essentially greater and they withdraw from reality more definitely. We therefore approach the problem as passively as possible by allowing the children to participate passively, actually listening and building their own fantasies, whatever they happen to be, in relation to the music. Gradually as reactions are observed it is possible to find the types of music to which the child seems to respond most satisfactorily and to build these into a semblance of organization. At this point the child himself usually makes some effort at voluntary response. This may be negative reaction in attempting to interfere with the organization, or it may be positive, in which the child requests his own participation in the music session. In either case, by gradually getting his participation either negatively or positively, attempts are made to follow his emotional reactions as a means of self expression for the child. This takes considerable practice on the part of the music therapist and rather close relationship with the psychiatrist (pp. 109).

It has been suggested (Gaston, 1968), that perhaps autistic children show such an interest in music because there is such a dearth of other interests. Despert (cited by Sherwin, 1953) suggests three possible explanations for the frequency of unusual responses to music from autistic children:

> 1. These children appear to have exceptional acuity to sound.
>
> 2. This interest may be a secondary factor based upon the autistic child's preference for objects rather than people, who create words; it is "part of the total 'obsessive preoccupations' of these children . . . with sound, light, or various objects, or play."
>
> 3. Rather than being the result of a barrier against verbal human communications, music may be a primary factor functioning to prevent the development of such human communication (p. 829).

Benenzon (1981), in his work in Argentina, has found that musical sound is capable of transcending barriers in autistic children that are unsurmountable to visual, tactile and other sensory stimuli. Realizing that autistic children do communicate, but on a non-verbal level, musical sound was used to establish links of communication with these children based on non-verbal (musical sound) foundations.

The basic objective in Benenzon's work was to find an approach technique to reach children displaying characteristics of autism. The assumption was that music, because of its non-verbal context, should be used as a first approach technique. The first step was to find a specific sound which would penetrate the barrier of defense erected by the child, something Benenzon calls the 'crystal armor.' To find that particular sound would be to find that child's ISO sound identity.

The following steps involve the use of that instrument which has coincided with the child's ISO sound. The instrument is then used as an intermediary object to establish direct contact with the child. The result of this direct contact is the response of the child (emphasis mine). Any response, according to Benenzon, opens up a communication channel, crossing the 'crystal armor,' but inversely to the previous channels, i.e. from the inside out. This, then, enables discovery and use of a new communication channel which is the imitation of the child's response. The channel may be a smile, a gesture or an emitted sound. At this point the therapist would use not only the instrument, but his/her own body as an instrument to imitate movement and gestures in imitative response to the child's responses.

The whole of Benenzon's work is grounded on the belief that to discover the ISO sound identity of the child, through the sound of an intermediate object, would be to find a link of communication with that child. Once found, the children involved with Benenzon did respond and were drawn out of themselves to a bit more normal social activity. In the process, a shaft of light from the outside world penetrated their imprisoned minds, enriching their lives with some of the wonder of the outside world.

There is no known cure for autism. Psychoanalysis and psychotherapy, according to to Despert (Wing, 1980) "have proved ineffectual because of the language and symbolism deficiencies characteristic of these children. Therapy must come from the _outside_ (emphasis hers) - education rather than interpretation of inner life." According to Ritvo and Freeman (1981, p. 16), "special education programs using behavioral methods and designed for specific individuals have proven the most helpful." Balow (1981, p. 257) says that "thus far, the only treatment that consistently produces positive results is education." Oppenheim (1974) concurs by saying that "for autistic children, education is treatment."

The following case studies reported by Gaston (1968), present some ~~of the~~ positive effects of music therapy techniques.

Case Studies

Case Study I

> The subject was a six-year-old boy with a diagnosis of early infantile autism established in two clinics. His symptoms and history conformed

well with the clinical picture of autism discussed earlier. Although his mother had stated that he liked music, a thorough exploration of S's abilities indicated that he was not musical himself. Nevertheless, some activities were probably helpful in improving his relationships with the environment and his peers.

At first S could not imitate the simple activities of another person. He would not observe a demonstration or look at any given object on request. His use of directed observation improved after a few weeks, probably as a result of his increased familiarity with the therapist and the activity period as well as the constant direct efforts to teach him to observe.

Another primary problem for this child was his inability to relate two aspects of his environment. He could march or do other simple exercises rhythmically without music, but the addition of music immediately disorganized him, and he would be unable to continue the exercise. He walked well naturally, but when music was playing he either ignored it, walking rhythmically but not in time to the music, or was completely disorganized by it, developing a very arhythmic gait or stopping altogether. This was seen as a manifestation of S's perceptual and cognitive difficulties: He was unable either to organize parts of the environment into meaningful wholes or to relate himself to his environment purposefully.

Rhythm-band activities were helpful in this area. S was required to play his instrument or clap his hands alternately with another person, without musical accompaniment, thus necessitating that he be attentive to the other person and relate himself deliberately to that person. This was difficult for him, and several weeks of struggling effort passed before he was able to carry this activity beyond a few exchanges. For rhythm-band activity with musical accompaniment, it was first necessary to teach S to play his instrument while the recorded music was playing. This required several weeks. The next step was to teach him to alter the speed of his playing compatibly with tempo changes in the music. Although his playing was seldom rhythmic, he did learn to alter his tempo in the same direction as the alterations in the music. Eventually, his rhythmicity increased also.

Throughout the period of study, S's ability to relate himself to the environment and meet its demands with purposeful responses improved. Although music therapy was only part of S's total treatment program (five half-day special school sessions per week), it was felt to have been of some help in his treatment (pp. 187-188).

Case Study II

When she began therapy, R was a morose six-year-old whose main preoccupation was knotting pieces of string. Her speech was minimal and echolalic, and she did not use personal pronouns. Her behavior was erratic and unpredictable. She had two 10-minutes music therapy sessions weekly, in which she beat on a small drum while the therapist accompanied her, trying to engage her interest by varying the rhythm. Although R was not able to follow the therapist's variations for long at the beginning, and would often beat distractedly in her own tempo or sit sucking her thumb, after a month she was able to imitate his rhythmic patterns and accents and follow accelerandi with him. When her song, "R__________ Can Say Hello," was included in the improvisation, she smiled.

Following this period of progress, R's responsiveness ceased; she became negativistic and regressed. For five months she was very evasive and obstreperous and seemed to make no progress in music therapy. Finally she resumed her interest. Through the following month her therapy sessions were extended to twenty minutes each, during which she worked continually at the drum. Music used for this child had much vitality and variety in tempo and dynamics; jazz was often used. When R took initiative in setting a style, the therapist would match it in his improvisations. After another month, during a very energetic session, R began to shout rhythmically with the music, then to sing, "R_________ can beat it, yes she can!" (the words to her jazzy song). Following this breakthrough into song, her drum beating was diminished. It was felt that as drum beating became more expressive of musical-emotional experience, she was propelled into new areas of expressive freedom; unable to resist what was happening to her, she just had to sing.

> R became so freely communicative that many songs were developed for her, several on subjects she suggested. Therapy continued in this fashion for another eight months, during which time she began spontaneously to use personal pronouns. Her vocabulary improved considerably, and progress in her behavior and responsiveness at home was reported (pp. 192-193).
>
> Case Study III
>
> Two years ago, the music therapist began working with S, who was then seven years old. S had begun to use speech at the age of five years. His speech consisted of several appropriate phrases, frequent echolalia, and several rigid speech patterns used for no apparent communicative purpose. Much of his behavior was ritualistic and compulsive, and it was difficult for anyone to break into his familiar patterns and initiate a change in his routine.
>
> S was able to learn songs rapidly and to carry a tune. He enjoyed records and listened attentively, usually sitting still, but sometimes rocking his body in rhythm with the music. About a year ago, he began to show curiosity about the piano, playing a few notes himself, watching and imitating the music therapist's hand positions and movements when she played, and affectionately saying, "This is the piano." He was attentive when the therapist showed him the letter names of the notes and soon learned all of them. His interest remained high as he progressed to the beginner's piano book, and he soon grasped new concepts - for example, the differentiation between right and left hands. He was able to understand the written symbol on the page and transfer it to the actual key on the piano. He also learned how to read and to play with correct fingering. This patient has progressed rapidly in his learning, has maintained consistent interest, and has recently started a second instruction book. He is now living at home and attending a special education first-grade class. He returns to the hospital weekly for his piano lesson (194-195).

Benenzon (1981) laments the fact that the almost limitless parameters of sound have not been more fully exploited in research and clinical practice as they relate to the mentally handicapped. If music educators and music therapists, through the infinite variety of musical sound, can increase communicative contact with autistic children, there is a greater chance that these children can enter the mainstream of life. Treatment for many may come only through the power of music. Music as an educative and therapeutic tool may have far reaching implications for the autistic child.

This present study will more fully exploit the world of sound by enabling autistic children to hear the 'live' sounds of eight different wind instruments. The purpose of the musical audition is threefold:

1. To diagnose the child's preferential sound, his/her ISO sound and to use the instrument(s) that produce(s) that sound as a nexus for communication with that child.

2. To use the instrument therapeutically. That is, to help, through the use of the instrument, to draw the child into deeper interpersonal relationships and more meaningful communicative contact with his/her world.

3. To use the instrument as an educative tool; to entice the child to imitate its sound with his/her own voice; to teach the child to respond in some way to it; to manipulate the keys or valves; to try to play the instrument himself/herself; to enable the child to experience tactile, auditory and visual modes of sensory stimulation; to engage the child in both gross and fine motor movement.

In this study, music is not an end unto itself. The final objective of the present study is the enrichment of life through the development of greater communicative skills for the autistic children involved. Music education can be a means to that end.

Summary

This chapter has focused on related literature pertinent to the study. First, an overview of the therapeutic use of music in history was reviewed. In the second section, an exploration of the ISO sound principle and how the internal sound identity can be tapped through the parameters of musical sound, was presented. The next section dealt with the handicapped child, followed by a description of autism and its prevalence as well as research and educational findings relative to the syndrome.

Finally, an overview of the use of music as a therapeutic approach technique with autistic children was presented. Emphasis in this section was on discovery of a musical sound empathetic with the autistic child's ISO sound.

CHAPTER III

RESEARCH METHODOLOGY

Conceptual Framework

This study is premised on the belief that there exists in each one of us an internal sound identity which both individualizes and characterizes us. This individual sound identity has long been associated with the ISO (Greek = 'same') principle.

Benenzon (1981) explains the ISO principle thusly:

> ISO means equal and sums up the notion of the existence of sound or a set of sounds or internal sound phenomena that are characteristic of us and that individualize us. It is a phenomenon of internal sound and movement that summarizes our sound archetypes, our intrauterine gestational sound experiences, and our sound experiences during birth and from infancy onwards. It is sound built within a sound mosaic, which in its turn is built up over time and is fundamentally found in perpetual movement.
>
> In very simple terms the ISO principle can be exemplified by saying that to produce a channel of communication between the therapist and the patient, the mental time of the patient must coincide with the sound and musical time executed by the therapist (p. 33).

Further elaboration of the ISO principle is given by Marius Schneider (1957). Schneider speaks of ancient civilizations and their tendency to identify each human being with a specific sound:

> In totemic civilizations there was widespread belief that each of the spirits inhabiting the world possessed his or her own specific sound. The ancestral totem, for instance, seemed to possess an acoustic life and to respond to certain

> sound. The imitation or simulation of that sound (or song) belonging to the totem enabled the man to identify himself with his mystical ancestor and thus to maintain its life through the contact [Schneider cited by Alvin (1975, p. 9)].

Juliette Alvin, the eminent British music therapist writes:

> Primitive man has often believed that every being, dead or alive, had his own secret sound or song to which he would respond. Today a subconscious, personal secret sound seems to be present in some pychotic individuals, and may confirm the old belief that each man is born with his own inner sound to which he responds (Alvin, 1975, p. 10).

After observing that music of melancholy mood and slow of tempo stimulated depressed patients more quickly than quick tempoed, lively music, and that faster tempoed music stimulated manic patients quicker, Altshuler (1948) gradually elaborated the ISO principle as fundamental to the practice of music therapy (see Benenzon, 1981, p. 33, and Critchley and Henson, 1980, p. 436).

This study, then, is based on the ancient ISO principle that 'like acts on like' - a principle whose application is germane to the questions posed in this study.

The purpose of the study was to investigate the potential of wind instrument sound as a nexus for communication with the autistic child. The methodology is threefold. The first part is diagnostic in nature. The second phase is therapeutic. The third phase is educative.

At the diagnostic level an attempt was made to discover the child's preferential sound, her internal sound identity, in other words her ISO sound. The second or therapeutic phase was built on the opening of channels of communication between myself and the children. Finally, the educative phase attempted to involve the children in vocally imitating and/or playing an instrument; teaching the child to respond in some way to the instrument; to enable the child to develop an awareness of cause-and-effect relationships between myself and the instrument and between the sound (auditory stimulation) and the movement of keys and/or valves (visual stimulation); and to engage the child in both fine and gross motor activity.

'Naturalistic observation' was chosen as the methodology of the study because of the symptomatic trait of resistance to change in the environment found in autism. One salient character trait of autistic children is that of an obsessive insistence of maintaining sameness in the environment without any alternative (Kanner, 1944; Rutter, 1978; Wing, 1980). To remove an autistic child from his/her natural setting to the artificial setting of the laboratory would make controlled testing extraordinarily difficult because any change or modification meets with perplexity and major discomfort (Kanner, 1944, p. 26).

This study does not presume that human interactions can be manipulated, scheduled, treated and/or modified. A study such as this posits, as Rist (1982) suggests, that the most powerful and parsimonious way to understand human beings is to watch them, talk with them, listen to them and participate with them in their environment, interactions and activities.

Paradigm Example

The paradigm example of naturalistic methodology is the anthropological method of ethnography. Naturalistic in this particular study is not so much concerned with the anthropologists' substantive concern with culture but with the investigation of phenomena occurring in the naturalness - as opposed to artificialness - of their settings (Donmoyer, 1979).

Objectives and Concerns

The objective of direct naturalistic observation procedures is to obtain information about the subject in his/her own natural setting (Barton, Brulle, 1983). The concern is with the possibility that the researcher's presence as an observer may unduly mediate and/or modify the natural setting which he/she wishes so strongly to preserve. The participant-observation phase of the study has been structured in such a way so as to minimize this concern.

Questions of validity and reliability rose to challenge the credibility of the present study. While these questions are important and were not disregarded or ignored, neither were they allowed to limit or impede interpretative analysis of the data. Triangulation of the various data collecting strategies greatly reduced any threat to validity and minimized potential gaps in reliability. Rist (1982) suggests that it is in the interaction of multimode strategies that the strongest evidence can be compiled and the most firm analysis can be presented. Stated differently, the more alternative sources of data employed in the analysis of a setting, the greater the possibilities for accuracy and a holistic presentation.

Sources of Data

Sources of the data for this study were the teacher-questionnaire, parental-interviews, participant-observation and participant-performer-observation. Supplemental data is later presented in the form of Observable Response Charts and Parent-Teacher Responses.

Background information relative to the location of the research study as well as background data pertaining to the children involved in the study will be presented in the next chapter.

Teacher-Questionnaire

A teacher-questionnaire drawn from Benenzon (1981), was used to abstract valid, relative and meaningful information about the child from the teacher's perspective. The value of such a questionnaire to obtain relative information about the child in naturalistic research is both significant and important. According to Rist (1982), it is one of the modes of data gathering open to researchers utilizing the naturalistic or qualitative research design. Like the parental-interview, the teacher-questionnaire was administered and analyzed prior to the participant-performer-observation phase of the study and was a means of giving me additional valuable insights, and enabled me to triangulate this mode of data collection with the other data collection strategies. (for an example of the teacher-questionnaire, see Appendix II).

Parental-Interview

Autistic children rarely communicate verbally. An interview with most autistic children would, therefore, be an impossibility. However, a parental-interview can reveal significant and valuable information about the child. Benenzon (1981) has used parental-interviews, as well as interviews in some cases with grandparents, to help uncover the sound prototypes and the social and environmental elements present during the gestation period, all infantile sound experiences and current ones. The information abstracted from these interviews aided in the discovery of the ISO sound and the intermediary object to be used as a channel of communication with his patients.

The qualitative research interview according to Kvale (Vol. 14, p. 174), is theme-oriented. In the case of this study, because the observee could not be interviewed directly, the interview was person-oriented. The interview with the parents attempted to abstract meaningful data about their child and to glean information which would be helpful in finding the child's ISO sound.

This particular means of data gathering was important to the study. To know of earlier sound experiences was the key to opening up a greater understanding of the child's current sound preferences. Constant audition of classical music, for example, was found in the history of some children (Benenzon, 1982, p. 46). Benenzon (1982, p. 20) also reports a case of a mother suffering from intense anxiety and anguish during the last six months of pregnancy. She found it most soothing to listen to Madama Butterfly. When the child was born, it was found that the only stimulus that would stop it from crying was an audition of Madama Butterfly. Other case studies have revealed the importance of knowing the child's earlier sound experiences (Kanner, 1943; Gaston, 1968; Sherwin, 1953).

Sherwin (1953) notes that the majority of autistic children are the offspring of very intelligent and sophisticated parents; "music and fine records may play a greater part in the environment of these children than in the average home." The parental-interview, then, contributed much relative information as to the child's socio-environmental background as well as his musical sound experiences. This information aided me in my attempt to diagnose the ISO sound identity of the child.

Parental-interviews were carried out during the participant-observation phase of the study. All interviews were recorded on tape after permission was granted by the interviewees. The use of a tape recorder for interviewing is encouraged (Steward and Cash, 1974), not only because it allows for exact reproduction of what was said, but also how it was said. Sample interview questions (see Appendix I), were drawn from Benenzon (1981).

Participant-Observation

In this particular phase of the study I attempted to safeguard and preserve the naturalness of the setting by making myself a natural part of the child's environment, a part of the child's 'landscape.' Prior to the actual testing of the child with wind instrument in hand, I spent a sufficient amount of time as an active participant-observer (as opposed to a detached-observer) so as to be an accepted part of the child's world. In my role as participant-observer, I became part of the experience of the child. In other words, I shared place, time, actions and activities with the child until such time that I perceived that I had not only gained the confidence and trust of the child, but that I was openly and happily accepted by the child and in her environment.

Participant-observation is a strategy central to most qualitative research (Rist, 1982). In this study my role as participant-observer was only an initial phase and tertiary in level of importance. The objective of this initial phase was to 'gain entrance' into the child's world, to gain the confidence and trust of the child, to be part of her experience. To gain the trust and confidence of the child during the preliminary role as participant-observer greatly reduced any threat to the child and enabled a smooth transition to my new role as participant-performer-observer.

Participant-Performer-Observation

Upon gaining entry and perceiving that I had gained the confidence of the child, my role changed somewhat to that of participant-performer-observer. An attempt at this stage, was made to diagnose the child's ISO sound identity through the audition of wind instrument sound. This was done as the child engaged in her normal activities in her own natural and familiar environment, namely, in her classroom or in the home. At times I took an inconspicuous place in the room and, as unobtrusively as possible, without calling any special attention to myself or the intermediary object, began to play one of the eight wind instruments that were used in the study. Each instrument was played, one at a time, in an attempt to isolate the instrument(s) or instrumental sound(s) that coincided with the child's sound-music tempo (Benenzon, 1982, p. 5); her ISO sound principle.

I did not feel that my presence as participant-performer-observer mediated or modified the natural setting of the children to the point of unnatural reactivity. I had pursued my previous role as an active participant-observer until I perceived that my new and changed role as a performer would pose no threat to the children in their natural setting.

Although I continued to be active in the experiences of each child by occupying the same space and being actively present with the child at the same time, new modes of stimuli were introduced through the audition of the intermediary object - the wind instrument used at the time. Through descriptive observation of the child's response during audition of the wind instrument I attempted to isolate the instrumental sound which coincided with the child's rhythm - sound - music traits - her ISO sound identity.

My intention was not to fully describe place, activity and action of the child. I intended to describe fully only those reactions and responses - an attentiveness, a smile, a gesture, an attempt to touch, taste or smell the instrument - which appeared to relate to and result from the musical sound stimulus generated by me on the instrument. Precision of description of responses is especially crucial in this diagnostic phase of the testing.

A full and precise description of each child's reaction to the musical sounds was recorded in my field notes and on the Observable Response Chart employed in this study (drawn from Gilliam, 1981, see Appendix III). In my field notes I hope to preserve chronological flow, assess local causality and derive fruitful explanations (Miles and Huberman, 1984) about each child's reactivity to the musical sound stimulus I generated on the instruments.

Field notes were written after each session with each individual child. These field notes attempted to describe as precisely and accurately as possible those reactions and responses which related to the diagnostic, therapeutic and/or educative phases of the study.

Analysis and interpretation of data gathered from the field notes and the Observable Response Chart occur both concurrently and subsequently to data collection. Rist (1982) says,

> to state that data and analysis occurs concurrent with data collection is only to acknowledge that fieldwork is not simply the mechanistic collection of predefined data from predefined sets of respondents. Rather, the entire time the researcher is in the field, there is a constant dialectic between collection and analysis, i.e., a constant assessment of what is known versus what is to be learned (p. 445).

Triangulation of the primary modes of data collection in this study, i.e., teacher-questionnaire; parental-interviews; participant-observation; and participant-performer-observation contributed rich and meaningful data for interpretation, explanation and analysis.

The research study took place over a four month period. Sessions with each child were one to two times weekly, and, depending upon the prevailing mood and attentiveness of the child, lasted as little as ten minutes or as long as forty-five minutes. One instrument was used at a time with no more than two instruments being played per session. All the music played was by memory as observation of the child during audition is crucial to obtain descriptive information about the child's reaction to the sounds. Emphasis was on description, explanation and ultimately interpretation of behavior rather than on prediction or an attempt precisely to define outcomes _a priori._ The 'artistic' (Eisner, 1980, p. 6) approach to this research study required on my part, an ability to imaginatively project myself into the life of the child in order to know what she was experiencing. That is, my task was to empathize, and to imaginatively participate in the experiences of the children.

Many autistic children never speak but remain mute all their lives (Wing, 1980). Although they may never communicate verbally, it has been strongly suggested by Anne Donnellan at the Canadian National Conference on Autism held in Winnipeg, Manitoba, in May, 1985, that autistic children do not NOT communicate. This is why the observation levels of this particular study are so vital. Autistic children do communicate, and vigorous observational scrutiny is all-important in this phase of testing. Donnellan also stated that "any mode of behavior is a form of communication." Therefore, it is believed that even the smallest gesture given in response to the instrumental sound in this study provided a clue to opening up meaningful channels of communication for that child.

Bearing in mind that autistic children appear to erect communication-blocking defenses (Benenzon, 1982, p. 9), the diagnostic stage of the study attempted to expose the children to sounds that were empathetic to their ISO sound identity; sounds that would result in an opening of channels of communication and a concomitant rupture (Benenzon, 1982) of the communication-blocking defenses erected by them. Once an instrument was found that penetrated the defense mechanism of the child and made an impact which resulted in positive observable response, I then took the child into the second and third phases of the study, the therapeutic phase and the educative phase.

The final two phases of study, the therapeutic and the educative, occur concurrently. For autistic children, education is treatment (Oppenheim, 1977, p. 42). Therapy, in the case of autism, must come from outside. Therapy must be in the form of education rather than interpretation of inner life [Despert cited by Wing (1977)]. Further, Balow (Gilliam, 1981 p. 257) reports that thus far the only treatment that consistently produces positive results is education. I encouraged the child's direct contact with myself and/or the instrument so as to reinforce any direct communicative effort initiated by the child.

Autistic children often show abnormal preference for olfactory, gustatory and tactile modes of sensory stimulation (Gilliam, 1981, p. 10). None of these modes of response were initially discouraged. In this study, tasting, touching and/or smelling were some of the means of initial communicative contact. In the Pilot Study as well, I was touched and smelled; and, in one case the instrument was caressed, tasted, licked and smelled by one child (see Pilot Study this chapter). I believe that such initial modes of communicative contact allow for deeper and more meaningful therapeutic and educational relationships later on.

Participant-Observees

Three children who met the five symptomatic criteria for autism as outlined by the National Association of Autism were selected for the study.

The symptomatic criteria include:

A. Signs and symptoms present prior to 30 months of age.

B. Disturbances of developmental rate and/or sequences.

C. Disturbances of responsiveness to sensory stimuli.

D. Disturbances of speech, language, and cognitive capacities.

E. Disturbances in relating to people, events and objects.

F. Obsessive insistence on maintaining sameness in the environment.

All three children live in the Edmonton area and were observed in settings that were natural to them, namely, their school and their homes. Grand Valley School was chosen because of the willingness of the administration and staff to have the study done at their school, and because all three of the autistic children participating in the study attend the school.

Delimitations

This study is delimited to three autistic children, all of whom are girls.

The attempt to find a nexus for communication with these three children through musical sound was delimited to the sounds generated on wind instruments only. These instruments were selected and played in familial pairs. The instruments employed in the study are as follows:

Recorder
Flute
Clarinet
Bass Clarinet
Alto Saxophone

Bass Clarinet

Trumpet

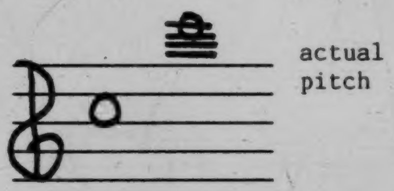
Tuba

The Instruments

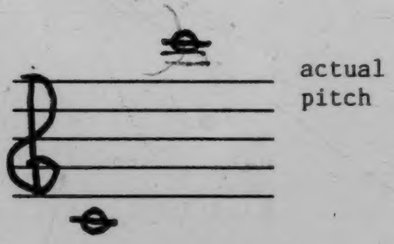
The eight wind instruments that were used in the study afforded the children a wide spectrum of musical sound with a richness and variety of timbre, pitch and intensity that enabled me to present parameters of musical tone never before heard live by them in their own familiar home and/or school setting.

The instruments that were used and the pitch ranges used for the purpose of this study are as follows:

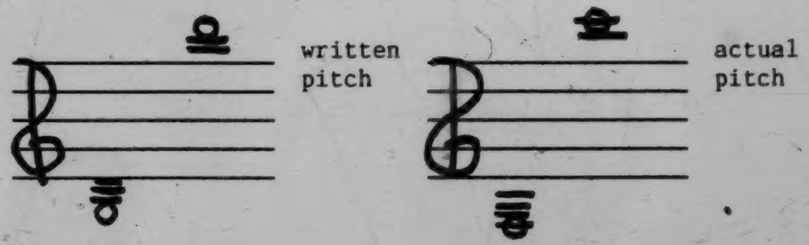
Recorder


actual
pitch

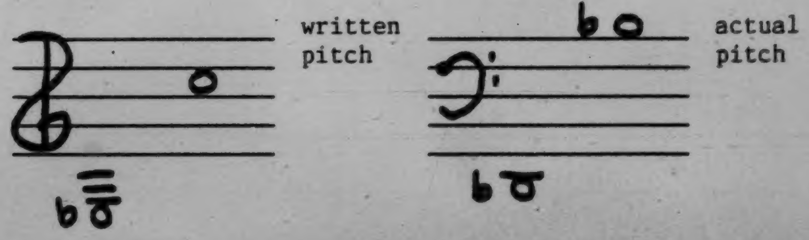
Flute


actual
pitch

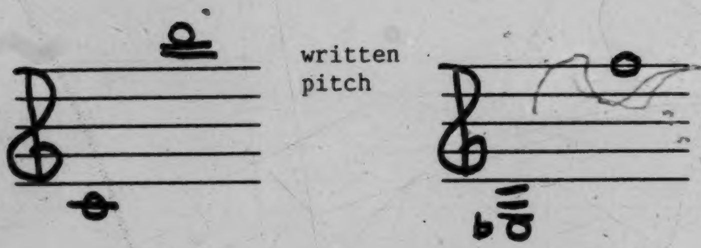
Clarinet


written
pitch
actual
pitch

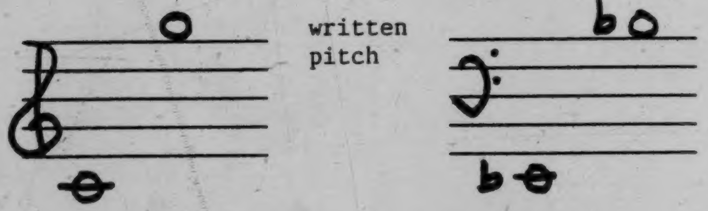
Bass


written
pitch
actual
pitch

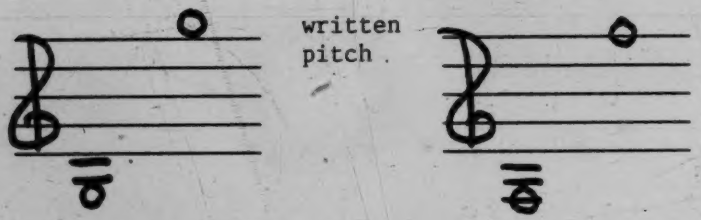
Alto Saxophone


written pitch
actual pitch

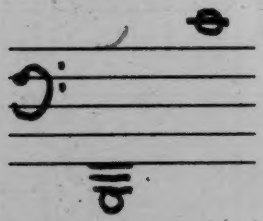
Baritone Saxophone


written pitch
actual pitch

Trumpet


written pitch
actual pitch

Tuba


actual pitch

Musical Sound Elements

There are at least three elements of musical sound which are consistently present in every musical tone. Any or all of these elements could be responsible for provoking communicative response from the child. These are:

1. Timbre (tone color, tone quality)
2. Pitch (frequency), highness and lowness

3. Intensity (loudness, softness)

Tone color (timbre) is one of the most suggestive and important elements in musical sound, according to Alvin (1975, p. 64), because it is non-rhythmical, purely sensuous, produces in the listener a pleasurable non-intellectual impression against which he/she does not erect a defense mechanism and has a deep psychological significance because of its associative power.

Pitch, or frequency of vibrations in sound, acts on the child in a purely physical manner. Pitch is a very evocative property of musical tone. Very rapid vibrations, in other words, a high pitch, usually is a strong nervous stimulus while slow vibrations or lower tones have a more relaxing effect (Alvin, 1975, p. 62).

Intensity, the dynamic level perceived as loudness or softness is easily manipulated. As tones move through time they can be controlled through various relationships of degrees of loudness and softness and can provoke numerous emotional responses. Loud music in some listeners makes a satisfying effect of plentitute and may even give them a feeling of protection against physical or psychological intrusion while softness may produce a feeling of intimacy, or may speak to the withdrawn or the timid by means of persuasion rather than of coercion or intrusion (Alvin, 1975, p. 64).

Limitations

The research study was restricted to the discovery of a sound or set of sounds which would provoke communicative response from the three autistic children involved in the study. Therefore, the generalizability of the study is limited. However, the possibilites of additivity to this study are numerous.

Pilot Study

A pilot study was carried out in June, 1985, at one of the Edmonton Schools serving autistic children. Four autistic children and one dependent handicapped child with severe language-communication deficits were tested. There was such immediate and unexpected response in three of the five children - the non-autistic child being one of them - that only the participant-observation and participant-performer-observation phases of the study were employed. Although the ISO sound identity was not found in two of the four autistic children, I believe that triangulation of the other modes of data gathering i.e., teacher-questionnaire and parental-interview, neither of which were used in the pilot study, plus a more protracted time line for the pilot study would have yielded more meaningful response from these two children as well.

Both the teacher and I were extremely encouraged by the rapid affective attachment displayed between the children and me during the participant-observation phase of the pilot study. This was true in four out of the five cases. In the fifth child there was no instance of emotional or physical affection shown to me. However, it was this child who showed the most immediate response to the instrumental sound and who appeared to develop both an emotional and physical affection for the instrument, a clarinet in this case.

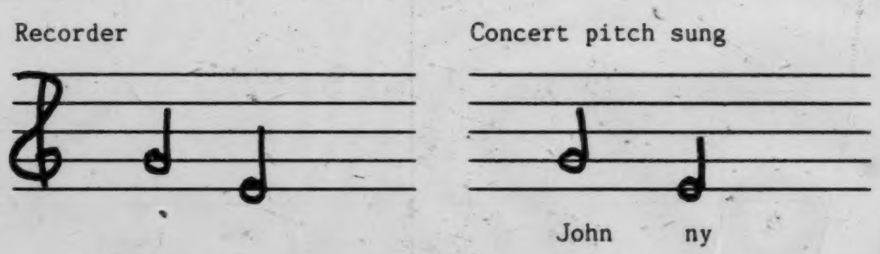
During the participant-observation phase of the pilot study, the teacher and assistants brought me into nearly all the experiences and activities of the children. I was pleasantly surprised and greatly encouraged by the rapport established so quickly between myself and four of the children. With no experience whatever in associating with low-functioning autistic children of this age level, and totally biased by all the literature which indicates that one of the most pronounced characteristics of young autistic children is being oblivious to other people, I was enheartened to have been hugged, kissed, touched, smelled and even led about the room hand-in-hand by one child. The teacher thought it quite remarkable that such an affective response would be evoked so quickly from the children - especially one child who most always is self-absorbed and oblivious to his environment.

Upon arriving on the second day of the pilot study I greeted the children in a firm, dynamic tone and proceeded to talk lovingly to them as I would to normal children. Perhaps the firm, albeit feigned confidence of voice intonation and inflection used with the children facilitated coaptation. To speak to autistic children in such a manner and receive response, verifies Oppenheimer's (1974, p. 42) assertion that autistic children are very perceptive in their interpretation of intonation and inflection, even though they do not fully understand what is being said to them.

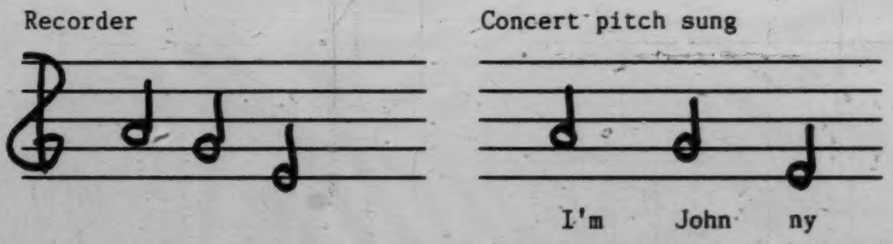
In that neither the parental-interview or the teacher-questionnaire modes of data collection were used, the major part of the pilot study, therefore, focused on observation and description of each child's response to the music-sound stimuli which were presented during the participant-performer-observation phase of the study.

The ISO sound identity of two children was diagnosed after the audition of the recorder, the flute, the clarinet and the tuba. In one case, the sound of the recorder coincided with the ISO sound principle of the child. This child, the only non-autistic child in the pilot test, exhibited severe language and communication deficits as well as cognitive and psychomotor delays. His case is here reported in that it offers evidence and verifies hypotheses about the ISO sound priniple and its discovery through the audition of various parameters of musical sound. One autistic child, although not nearly as responsive to or enthusiastic about the sounds emanating from the instruments as the non-autisic child, paid particular attention to the tuba sound. This child exhibited compulsive and stereotypic behavior as well as other autistic traits. The child insisted on being "off" the ground and incessantly would walk on the desks and window sills. This behavior was tolerated by his teacher. This child showed little to no interest in the flute or clarinet or recorder. The tuba sound attracted his attention as he was walking along the window sill. The child approached the instrument and peered into the bell as if perceiving that the sound emanated from that cavernous opening. The assumption is that it was the timbre and/~~or the pitch range~~ of the tuba which attracted the child as the melodies played on all the instruments were the same, all were played in the same key, and dynamic levels were controlled and kept at moderate levels. In other words, the variables of melody, rhythm, intensity, key and pitch were held constant. Only compass (pitch range) and timbre were left to be reckoned with. It is believed, therefore, that it was the tone quality and/or the low compass of the tuba sound which conincided with the child's ISO sound.

In the case of both of these children, transition into the therapeutic and educative phases of the pilot study was smooth and natural. For a number of sessions I played short two or three note phrases to match the syllables of their names. For the non-autistic child I played:

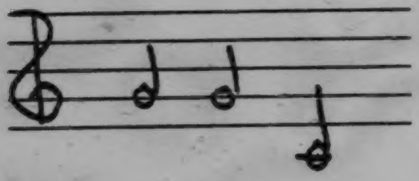


and then sang the pitches back to the child, one syllable for each syllable of his name. Without hesitation the child sang back his name to me in the exact pitch in which it was played. I changed the key a number of times and always got an identical pitch response with the child singing his name. This was always accompanied by a happy smile and sometimes a squeal of sheer delight. After a number of exact responses to the child's two syllable name, I added a tone.

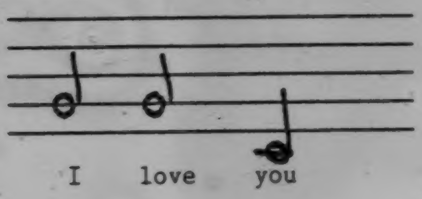


After playing the three note phrase I sang, "I'm John--ny" (not his real name). The child sang the phrase back in exact pitch. Another three note phrase was added to the repertoire: first played and then sung.

Recorder



Concert pitch sung



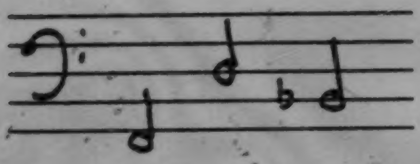
"I love you." Again this was repeated in exact pitch and rhythm by the child.

A four-note phrase was played and sung by me but the child was unable to repeat it or sing it in sequence. Perhaps four notes in sequence was too much for him at this stage.

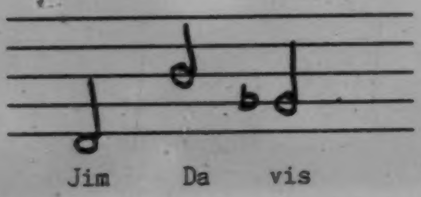
The child attempted to manipulate my fingers on the holes of the recorder and emitted squeals of delightful laughter when I placed the recorder in his mouth and let him "squeak" out a note. The child seemed never to tire of this activity.

In the case of the other child, a three note sequence was repeated over and over again on the tuba and then sung.

Tuba



Concert pitch sung

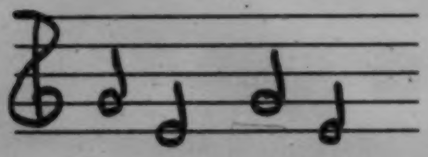


On the third day the child, who was walking on a table, stopped, sang back the three-note phrase right on pitch, and in clearly enunciated tone "Jim Da - vis" (not his real name). I was successful in getting this child to repeat the singing of his name several times, in different keys, and always on pitch and in proper rhythm. At one point I was explaining that the instrument was a tuba. "Can you say tuba, Jim Davis?" "Ba ba," was his response. This was an encouraging attempt and step toward verbal communication. In this case, the tuba was used successfully as an intermediate object and served as a nexus for communication with the child.

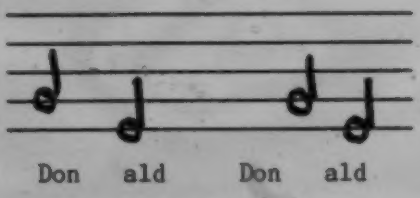
The reaction of the third child was most remarkable. There had been no participant-observation phase of the pilot test with this child. I was brought to the child's class on one day and only observed the child eating lunch. The next day the child accompanied me down the hallway to the classroom used for the pilot study. The teacher came as well. The child refused to hold hands on the walk to the classroom and never showed any affection for me during the testing. Sitting in the corner on the carpet and playing with toys, the child was facing away from me. Upon hearing the sound of the clarinet he turned abruptly, scooted over to me on all fours, thrust his hand into the bell, grabbed the keys and began to taste the bell of the instrument.

The child was so taken by the clarinet sound that he was aggressive and rough in his attempt to fully "sense" the instrument. In the case of this child, visual, auditory, olfactory, gustatory and tactile modes of sensory stimuli were manifested. The child's reaction to the sound was abrupt and immediate, as though something had penetrated his mind for the first time. The audition of music was a regular activity for this child. He had learned to insert tapes into a cassette recorder and turn it on and off. Presumably the child had heard a clarinet sound before, at least in the greater context of orchestral sound on radio, T.V. and/or tapes, yet never as an isolated instrument sounding live in his own natural setting. The teacher convinced the child that the instrument was not to be touched (a key was bent as a result of the initial aggressive behavior of the child). The child then leaned back, put his head in the teacher's lap and listened to the music in a relaxed but attentive manner. The teacher was surprised at the child's willingness to put his head in her lap, something he had never done before (autistic children are usually tactually defensive) and was also surprised at the long attention span given by the child to the instrument. Most unusual was his attempt to sing his name. This child does not say his name but very decidedly attempted to repeat a two-note phrase played for him, this time on the recorder.

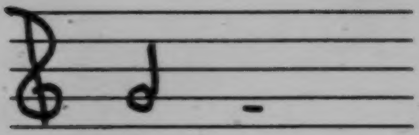
Recorder (sounds 8va higher)



Concert pitch sung



Child's response



Don

After a number of repeats both played on the recorder and then sung, Donald, in a very high guttural tone, right on exact pitch, sang "Don---." He never did produce the second syllable to his name; but, his sung note was very clearly an attempt to say (sing) his name. The teacher thought this to be quite remarkable as Donald had never said his name before. (Masculine tenses have been used throughout the reporting of the pilot study to ensure anonymity).

Applied Music Preparation

The abstracting of meaningful data from the musical sessions in the study was dependent to a large degree on my musical performance. All three phases of the study, the diagnostic, the therapeutic, and the educative, demand a high level of performance ability on each of the instruments to be used in the study. Prior to entry into the field of testing, whether that field was the home or the classroom of the child, I spent several hours of practice on the eight wind instruments. It was imperative that I had both a technical skill and a good tonal quality on each instrument so as to allow complete technical, rhythmical and stylistic freedom as I improvised the music according to the spontaneous response of the child.

Pre-entry musical preparation, then, saw me on a developmental regime to:

1. Develop technical skills
2. Develop good tone quality
    a. embouchure (facial muscles used to produce and control tone production)
    b. breath control
    c. posture
3. Develop performance in various rhythms and styles

Introductory Letters

Letters of intent describing the purpose of the study and asking for permission to conduct the study were sent to the following:

The parents
The School

Summary

This chapter outlined the research methodology of the study. The conceptual framework as well as the objectives and concerns of the study were presented. Following this, the data gathering strategies were presented. These included the Teacher-Questionnaire, Parental-Interview, Participant-Observation, and Participant-Performer-Observation phases of the study.

Musical notation of the range of each one of the wind instruments used in the study was also presented. A description of how these instruments were employed is presented in the section on the pilot study.

In the final section, the pre-entry preparations necessary for beginning the study were presented.

CHAPTER IV

Presentation of the Data

Introduction

There are four data collection strategies central to the qualitative nature of this research study: 1) background data, 2) questionnaire, 3) interview, and 4) observation. Data from the Observable Response Charts and Parent-Teacher Responses are also presented. The combining of these strategies provides for a validity check on the data and allows for the opportunity to triangulate them. Juxtaposing the description of when and where the study unfolded, with what was said, what was written, and what was observed, allows for greater possibilities of accuracy and validity. As well, it provides alternative sources of data to confirm analysis. The greater the alternative sources of data used in the analysis of a setting, the greater possibilities for accuracy and a holistic presentation (Rist, 1982).

In this chapter I will present the data collected throughout the duration of the study.

First to be presented will be background information relative to Grand Valley School, its philosophy, its staff, its students and its programs. Included as well, is data pertaining to C, J, and T, the three autistic girls involved in the research. Following this will be data from the teacher-questionnaires and the parental-interviews. Data abstracted from the teacher questionnaire gave new and insightful information about each child's musical-sound profile within the context of Grand Valley School. Knowledge of each child's level of response, hyperreactivity and/or hyporeactivity to various modes of sensory stimuli, behavior traits, activities, and response to both peers and adults enabled me to structure the musical performance sessions with each child in such a way so as not to set off any intense states of alarm. For example, being aware of each child's level of tactile defensivity would guide me in the employment of the degree of tactile stimulation to be utilized in the study. Allowing the children to experience the tactile sensation resulting from the vibration of the instruments during performance, touching the keys and feeling the smooth shiny surface of the brass instruments would be part of the overall music session with them. Data from the parental-interviews are transcribed from the original tape recordings of these interviews. Information abstracted from these interviews focuses on the socio-environmental and musical-sound history of each child involved in the research sudy. As the interview responses from the parents were analyzed, a picture began to emerge of each child's socio-environmental and musical-sound background. Data gleaned from these interviews enabled me to uncover some of the sound prototypes present in each child's environment from the pre-natal period up to the present. This informaton better enabled me to formulate the musical-sound structures that I would employ during the diagnostic and therapeutic phases of the study. For example, awareness of one child's rejection of high pitched sounds and sounds of high intensity would serve to guide me in the way I would use loud, high frequency pitches with that child. Being cognizant of this child's fear and rejection of such sounds in her past would serve to alert me to employ the higher pitched instruments with greater restraint and to be more sensitive to the possibilities of inducing fear or rejection in that child.

Next, data abstracted from the participant-observation and participant-performer-observation phases of the study will be presented.

These data are in the form of description. Stringent observational scrutiny is vital for precision in validating and interpreting the children's level of response during the audition of each instrument. Any response or reaction to the musical-sound stimuli, be it verbal or non-verbal, or a seemingly insignificant physical movement or gesture could be a clue to establishing a link of communication with that child. Rigorous description of each child's level of response is vitally important. The descriptive data begin with information gleaned from the participant-observation phase of the study. What was observed while the children were in their classrooms and/or homes was recorded in my field note journal. Data from the field note journal attempt to precisely describe each child's level of response to the musical-sound stimuli generated on the wind instruments employed in the study. The descriptive data will focus on the two research questions posed in this study. Descriptive information relating to the child's response to timbre (tone color), pitch (highness-lowness), and intensity (loudness-softness) during musical performance sessions was stringently recorded in the field note journal. Verbatim excerpts from my journal are reported in this chapter. Supplemental data from the Observable Response Charts record the immediate overt reaction to the musical sound stimuli of each instrument. Quick and easy reference is made to each chart and to the Composite Observable Response Charts to note any pattern of either preference, rejection, hyperreactivity, hyporeactivity or other responses to any of the sounds generated on the instruments. Comments are noted at the bottom of each chart (see Tables 1-36).

Finally, responses and comments from the teachers and parents who observed a number of the music sessions are presented (see Appendix VIII).

All relative and cogent data from the various data collection strategies employed in the study will be reported in this chapter. Data germane to the purpose of the study will be reported as fully as possible so as to let the information speak directly and systematically to the questions posed in the study.

Background Data

The School

Grand Valley School, designated as a Category II Private School by Alberta Education, is operated by the Grand Valley Association for the Handicapped (G.V.A.H). The school building was constructed in 1963 by the G.V.A.H., and is located in the Edmonton area. Grand Valley School has been serving handicapped persons since its inception in 1963.

The School Philosophy

The Grand Valley School philosophy states:

> that all children have a right to education, and that the school's primary responsibility is towards growth and development of the children who attend the program. Opportunities are provided to increase each child's skill level through the use of direct instruction and other valid educational procedures. Integration is a very important component as the staff at Grand Valley School strive for the normalization of their children. Although not stated in the written school handbook, parental involvement is also an implicit component of the school's philosophy. (from Grand Valley School, Alberta Education, August, 1985).

The School Staff

Grand Valley School is staffed by a Managing Director, a

School Program Coordinator and five teachers and five teacher-aides. A speech pathologist, physiologist and psychologist also provide direct service to the children at Grand Valley School.

Teachers are either certified in the Province of Alberta and/or have had previous experience with mentally and physically handicapped children. The rationale for hiring personnel is most interesting. The caring ambiance so evident at the school reflects this hiring philosophy. Teachers are hired on the basis of their commitment to and experience with mentally handicapped children. Teacher education is given lower priority in the hiring of teachers than these other two characteristics. Such a philosophy is congruent with my own way of thinking and enabled me to carry out my study in a milieu both harmonious and consonant with my own approach to research dealing with human beings.

The Students of Grand Valley School

Students at Grand Valley School are all functioning in the moderate to severe range of mental disability. In addition, some students have one or more physical handicaps and/or behavior problems.

The School Programs

Three programs are presently housed in the school building: the Early Education Program, the school program which includes an Independent Living Skills classroom, and the Vocational Training

Program. All of these are day programs, and, with the exception of the Vocational Training Program, the programs parallel the local public school system program.

The Early Education Program rationale is premised on the belief that children with developmental delays can benefit from a well organized, systematic remedial program in which students, staff and parents work together in partnership. The Early Education Program serves children who exhibit delays in cognitive, speech, motor or social skills. The goal of the Early Education Program is to foster development and improvement in these areas. The three girls involved in the present musical study are all part of the Early Education Program at Grand Valley School.

The Children in the Study

The three autistic girls involved in the research study were selected on the basis of:

1) their meeting of the diagnostic criteria for autism as outlined earlier in this dissertation (see Chapter III),
2) the willingness of the parents to allow them to participate,
3) the parents' own willingness to be interviewed,
4) the suggestion of the Educational Coordinator at Grand Valley School,
5) my own perception of the needs of the children.

Each of the three girls in the study presents all of the diagnostic criteria delineated in Chapter III of the dissertation, plus other characteristic traits attributable to the syndrome of autism. J and T present one or more severe physical and mental anomalies as well. All three are non-verbal.

Background Information Relative to C:

Age: Five years, eleven months

Parents: Father and mother both living together at home

Siblings: None

Diagnosis: Severe to Profound Behavior Disorder/Autism

Recommended Educational Program:

A highly individualized education is considered a necessity due to C's limited ability to understand, communicate, learn or participate in social relations. It is recommended that C's education program consist of the following components:

1) peer interactions with non autistic peers in a play setting
2) structured teaching sessions, preferably one-to-one that emphasize attending and imitation skills
3) speech and language emphasis
4) an applied behavior analysis emphasis (from C's Assessment Report, Grand Valley School, by permission).

Background Information Relative to J:

Age: Ten years, six months

Parents: Father and mother living together at home

Siblings: One brother, eight years of age

Diagnosis: Microcephaly; congenital ptosis; psychomotor retardation; hearing loss; severe speech and language delay. J presents many of the characteristic traits attributable to autism. As well, an early diagnosis was that J exhibited symtoms of Kaufman's Syndrome.

Recommended Educational Program:

1) continued speech therapy
2) increase involvement of mother in J's treatment
3) explore effectiveness of J's hearing aide (from J's Therapy Report, Grand Valley School, by permission)

Background Information Relative to T:

Age: Six years, five months

Parents: Father and mother living together at home

Siblings: One brother, seven years of age

Diagnosis: Mental retardation; autistic-like behavior secondary to mental retardation

Recommended Education Program:

1) required stimulation through play therapy
2) encouragement to touch/explore her environment in a non-threatening 'fun' type atmosphere
3) accept (initally) T's limits on what she will or will not comply with
4) establish rapport with T and be more firm in dealing with her self-stimulating behaviors (from T's Therapy Report, Grand Valley School, by permission)

Teacher-Questionnaire

The teacher-questionnaire employed in this study was used to abstract relative and meaningful data about the child from the teacher's perspective. Specific questions to the teachers translate into requests by me for information about each child within the context of Grand Valley School generally, and classroom activities specifically. Specificity and scope of the total research project served as a framework for the content of each question. Like the parental-interview, the teacher-questionnaire was administered and interpreted prior to the participant-performer-observation phase of the study.

The import of the teacher-questionnaire is, in part, to establish a profile of sound-music-behavior traits while the child is absent from the contextual influences of home and family. Autistic children, like normal children, tend to respond differently within the contextual structures imposed upon them. An awareness of any significant behavioral or responsorial differences between the home and school environments revealed by the teacher-questionnaire and the parental-interviews would help me in structuring the music sessions with the children.

The teacher-questionnaires were distributed during the participant-observation phase of the study. Data from the questionnaires was analyzed prior to the actual music sessions with the children. These data are presented below.

Teacher-Questionnaire Relative to C

Q. 1. How long have you worked with C?

A. I have worked with C for approximately two years.

Q. 2. Does C make any sounds?

A. C will occasionally vocalize "mm" or vowel sounds. She has been heard to repeat a word on very rare occasions.

Q. 3. Does C appear to enjoy/reject any sounds?

A. C enjoys most musical sounds. She will sometimes become upset if another child cries or if music is too loud.

Q. 4. Does C startle to sudden sounds?

A. C does not startle consistently to sudden sounds.

Q. 5. Does music of any kind appear to affect C? How?

A. Haven't noticed a real difference in kinds of music, but she does not like a loud band.

Q. 6. Does C ever attempt to sing or emit sounds of different pitches?

A. C has vocalized on occasion when we sang songs but not any vocalizations that one could call 'musical.'

Q. 7. Does C enjoy playing with things that make noises? What things?

A. Yes. C enjoys the tape recorder with music on it, as well as the Fisher-Price radio or T.V. However, I have not seen her seek these toys out at school.

Q. 8. Does C try to locate the source of sound or music?

A. Yes. She will hold her ear to the phono, T.V., or radio.

Q. 9. Has C ever tried to imitate music that was present in her environment?

A. No.

Q. 10. Are there any stereotypic or compulsive sounds C makes? If so, could you imitate or sing them to me?

A. C has a laugh and noise she will make when somewhat irritated. However, these are not compulsive or frequent.

Q. 11. Have you any suggestions which might help me assess the importance and/or influence of music on C's life?

A. Not really. It will be interesting to see how C reacts to your research.

Q. 12. Are there any shapes, colors, textures or material which seem to give C sensory pleasure or dissatisfaction?

A. C loves anything that is shiny (bells). She enjoys ordering things in her environment - putting cylinders into containers in order of size. She likes the Maze toy which involves moving beads of various colors and shapes through a wire. C likes to pick up 'specks' of food or other substances and eat them (loves pretzels). She likes play dough but will eat it.

* * *

Teacher-Questionnaire Relative to J

Q. 1. How long have you worked with J?

A. Six months

Q. 2. Does J make any sounds?

A. J says "Hi" spontaneously. She tends to repeat this word but is often said appropriately.

Q. 3. Does J appear to enjoy/reject any sounds?

A. J enjoys her "mini pops" tape and being 10 years old this is appropriate for her. She will clap her hands. I discourage fist banging, hand clapping or head up response with J.
Her attention span is short - 2 minutes if she's not actively involved.

Q. 4. Does J startle to sudden sounds?

A. No startle response has been observed.

Q. 5. Does music of any kind appear to affect J? How?

A. Music of all kinds seems to have positive effects on J. She smiles.

Q. 6. Does J ever attempt to sing or emit sounds of different pitches?

A. This has never been observed at school. J's voice seems to come from the back of her throat and have a slight nasal quality.

Q. 7. Does J enjoy playing with things that make noises? What things?

A. Yes. Jack-in-the-box is a favorite toy.

Q. 8. Does J try to locate the source of sound or music?

A. J will look and locate the tape recorder to indicate she wants it played. She will turn her head to locate sounds.

Q. 9. Has J ever tried to imitate music that was present in her environment?

A. J will imitate a sneeze or a cough when someone is using a Kleenex. She will make these sounds in anticipation as well as imitation.

Q. 10. Are there any stereotypic or compulsive sounds J makes? If so, could you imitate or sing them to me?

A. J will make a grunting sound when she is angry.

Q. 11. Have you any suggestions which might help me assess the importance and/or influence of music on J's life?

A. I would like to see J sit for five minutes independently (without adult participation) and listen to a music tape - or to sit by herself until the song is completed. J needs activities at home and at school that she can do independently.

Q. 12. Are there any shapes, colors, textures or material which seem to give J sensory pleasure or dissatisfaction?

A. J is tactile defensive around her face and is annoyed if instructor persists.

* * *

Teacher-Questionnaire Relative to T

Q. 1. How long have you worked with T?

A. Four months.

Q. 2. Does T make any sounds?

A. T makes a squealing sound. Initially this sound appeared to indicate unhappiness. In the past few weeks this sound is being heard spontaneously.

Q. 3. Does T appear to enjoy/reject any sounds?

A. T has giggled to a party horn being played.

Q. 4. Does T startle to sudden sounds?

A. Her startle reflex doesn't appear consistent but has been observed when a tin container is dropped on the floor.

Q. 5. Does music of any kind appear to affect T? How?

A. T appears content to sit if tape recorder is on.

Q. 6. Does T ever attempt to sing or emit sounds of different pitches?

A. Makes a crying noise.

Q. 7. Does T enjoy playing with things that make noises? What things?

A. T hasn't demonstrated any play skills. We are encouraging her to hang on to a soft wind-up doll that plays "Brahm's Lullaby" and "Rock-a-Bye Baby".

Q. 8. Does T try to locate the source of sound or music?

A. T is not consistent in her response to sounds made to the left or right. She will follow bells that are jingled or a horizontal plane in front of her.

Q. 9. Has T ever tried to imitate music that was present in her environment?

A. No. T is just beginning - this past week - to clap hands in imitation to music!

Q. 10. Are there any stereotypic or compulsive sounds T makes? If so, could you imitate or sing them to me?

A. T has been very quiet and is just beginning to make a squealing noise at school.

Q. 11. Have you any suggestions which might help me assess the importance and/or influence of music on T's life?

A. It would be nice to see T come and join a group during a sing song or to seek a tape recorder that is playing a familiar song.

Q. 12. Are there any shapes, colors, textures or materiial which seem to give T sensory pleasure or dissatisfaction?

A. T likes soft things and will get a towel that is on the table and cuddle with it.

* * *

Parental-Interview: C

Interviewer: This is February 19, 1986. I am at C's home. I'll start by asking C's age.

Mother: She is five years, nine months.

I: And her birthdate?

M: April 27, 1980.

I: Does she have sisters or brothers?

M: No. She is an only child.

I: What kind of music or sounds surrounded C during pregnancy and immediately after birth? (Pause) - Did you listen to a lot of music yourself, did you practice the piano . . .

M: No. No musical instruments. A variety of music, I guess; nothing very loud or vibrant, music with pleasant tones - nothing stressful. No hard rock or anything like that.

I: Can you be more specific: Classical? Country?

M: Yes, Country.

I: Did you attend any live concerts?

M: No, not during pregnancy.

I: Do you remember what C's first sounds were?

M: Tiny infant sounds. Gurgling sounds. Much like a normal baby. She seemed to want to express herself. I think we noticed she had a lot of facial expressions. We knew when she was happy or when she wanted something. There were two or three months when she --- she really wanted to express herself by more than just looking at you.

I: Could you tell whether or not she was happy or if she wanted something? Not just from facial expressions but you could tell from the sounds she made?

M: Yes. They were normal sounds as far as we could tell.

I: Were there unusual sounds, voices or music that surrounded C during the first days of her life?

M: It would have been hospital sounds. In the nursery they would have been very muted and soft. The ward was quiet most of the time.

I: How long was she in the ward?

M: Five days.

I: After you brought her home, were there any unusual sounds, voices, music, grandparents, kids screaming?

M: Nobody other than (father) and myself. Occasionally a few people.

I: No particular loud noises like building construction, buses, trucks, sirens, etc.?

M: Not really. We lived in an apartment then and we did get the usual apartment noises. We did always hear the water when it was turned on. She would turn when she heard this and seemed alert. I don't think we ever questioned if she had a hearing problem or didn't respond.

I: Then you were never concerned about her level of hearing?

M: Not really. But to this day we are not sure that every sound she hears comes across the same way it does to us. That's about all, the apartment was quite soundproofed, we did not get all of the traffic noises of people coming and going. We reassured ourselves that a tiny infant could tune into a sound (water) like that.

I: Can you describe or imitate some of C's first sounds?

M: There were some certain sounds that she used to say quite often. When she would see certain people at about three-four months, she would say 'oo,' 'ah.' Up to about six months just normal baby sounds, 'ta, ta,' 'oo' and 'ma ma' would occasionally be in there. We checked the baby books for milestones and ----

I: she seemed to be right on schedule.

M: Right.

I: Were there sounds that C seemed to reject? Pause -- Would she startle?

Father: Not at a very early age.

M: No.

I: Were there sounds she preferred? Pause -- Did you use the electric razor or any other appliance that seemed to attract her?

M: The vacuum cleaner. She liked the sound of the vacuum cleaner. The mixmaster, she seemed to be afraid of it. There was a time when a lot of things distressed her. Even now she doesn't like it. It has a high-pitched kind of whiny sound. Different from the vacuum. She still doesn't like it. The popcorn maker. She fears that. She won't stay in the room with that. There's something about the mixmaster and popcorn maker - she will just leave the room. If you try to keep her in her chair she would be very uncomfortable. No other sounds. I can't think of any. She's listened to a variety of music from young; classical, singers, nursery rhymes, she seems to be pretty flexible. She has her favorites.

I: Did you ever sing to her?

M: Yes, her favorite songs;"Rock-a-Bye-Baby"was always a favorite. She seemed pleased when you would sing just about anything to her. She'd smile, lots of eye contact. You knew she enjoyed it even if I wasn't so good at it.

I: Why did you sing to her? Were you doing it because that's just the thing all mothers do, or were you trying to calm her down?

M: That's part of it, especially for sleeping and to relax her.

I: Did it relax her?

M: Yes. It's something she enjoyed and she would smile at you. That encouraged you - to know that she enjoyed it. Also "Pat a Cake,' she enjoyed that. That was part of our play.

I: And she continued to enjoy this after age two, when you began to notice that she was not responding normally?

M: Yes: I remember one night singing for a long time.

F: Yes.

M: (to husband) in fact you said we should put it on a tape because it would be easier.

F: Right.

M: I can't say always it would do the trick, but you do try when it does work. When it's two or three in the morning you'll do whatever it takes.

I: Did C ever seem particularly drawn to music on radio, TV or records? If so, do you recall what kind of music, vocal, instrumental?

M: Vocal, I'd say. Records and tapes first, TV second --

F: Commercials, mainly commercials.

M: That's where you get your music. Catchy little tunes --

F: Your M.A.S.H. tune, she could be in another room and she'd run right in.

M: Yes, she always did.

I: She really liked the tune from M.A.S.H.?

M: Yes, it's kind of light.

I: That's interesting. I'll play that for her on the different instruments and see if I get any response from her.

I: These things are important to know because it affects the way I structure the music sessions with her.

F: She paid special attention to the man on Entertainment Tonight. Whenever he came on she would cover her eyes --

M: and peek out at him. Anne Murray has always been a favorite. I think we have some children's records but I don't think she'd know the difference between TV or the record. Radio, that's just not her medium. I think that's because she's always had records.

I: If the TV is on and the music begins or changes mood or style or volume - does she notice, will she attend?

M: Not usually. Commercials, that is music rather than the picture. That would be interesting to notice. She really doesn't watch. Even with commercials she is sometimes gone out of the living room.

I: No particular difference between vocal and instrumental music?

M: In all truth, mostly vocal. There's not that many instrumental pieces we play for her. Pinnochio and a lot of the earlier Disney has lots of classical music and she listened to that. If she didn't like it she'd have you turn it off or she'd leave the room.

I: Does she prefer any instrumental sound now - anything that you notice?

M: Dark sombre music she doesn't like. There's one "Ding dong dell, Pussy's in the well." She didn't like that. Every time it would come on she'd leave the room, maybe cry a little, cover her ears, then she'd come back when it's over. There has been other music over the years --

I: -- that she rejected for some reason?

M: -- yes, it kind of scared her. She really hasn't had a chance to listen to a lot of instruments. She likes bells. Lighter sounds. She likes guitar music. She listens to a lot of country music. Even piano, she really doesn't hear much, not even in school and we're not musically inclined. I think she'd be fascinated if she had the opportunity to sit down and listen, at least to be in the same room.

I: You mentioned that there were sounds or songs that she would reject. Can you elaborate more on that?

M: They came across to me as dark and ominous, maybe not to her. Not loud really. It was difficult to always tell. She would cry easily and it was hard to tell from what. That was a time when a lot of things frustrated her, no eye contact, life was difficult at that time. I can't really say for sure what (in the music) it was. Now, when she's in the mood for listening she's pretty flexible in what she listens to. I guess we buy records we know she likes. Maybe we don't experiment enough.

I: Are there any songs she particularly likes now? I would like to know so I could play them for her.

M: Just about any of the Disney records she's familiar with; Pinnochio, Cinderella, Sleeping Beauty.

I: Standard nursery rhymes,"Twinkle, Twinkle, Little Star," "Row, Row, Row Your Boat" ---

M: Oh yes. Anything like that. She really enjoys those.

M: Anne Murray. There's something about her voice that she really likes.

F: She also liked Charlie Pride. He also sings kind of low.

M: Kenny Rogers - "Ravi" - "Snowbird" - that was always something she liked. Does that help you?

I: Yes, very much. I want to know the sounds and the music that has been a part of her background. Along the way I'll imitate those sounds and play some of the music familiar to her. I'm really more interested in finding out what sounds might reach her and not the songs so much. I'm looking for an instrument that might penetrate that autistic shell and get through to her. I'm looking for a link to communicate with her.

I: When you sing to C, does she respond to the words? An action song for example, would she clap her hands on cue if the song was asking for this?

M: She would pretty well need some prompting. "Ring around the Rosey" or "Hokey, Pokey," whereas most kids would turn around or fall to the floor, with her you might have to help her with it and repeat it.

I: So she doesn't take her cue from the words.

M: If I understand what you mean, she actually needs help, clapping her hands for example.

I: Does C make any sounds now that resemble a musical pattern?

M: Not really. They're never the same. (to the father) Can you think of any?

F: No.

M: Just 'oh, oh, oh' (descending scale pattern)

I: That's interesting because now that I've heard that, I'll try to imitate that sound pattern on the instruments.

I: Do you have any special way of communicating with C?

M: We do (laughter). She does understand a fair amount of words - 'sit down,' 'time to go outside.'

I: I noticed when you asked for a kiss she knew exactly what you desired of her.

M: Oh, yes.

F: If you ask her to put her socks on right now, she will do it.

M: It's difficult to know where her understanding stops. You can give her a sentence and if you have the word 'fridge' in it she may think it time to eat.

F: More than one command confuses her.

M: That's true.

I: Does anyone else, perhaps through music, bodily movements or different expressions, have a way of communicating with C?

M: With C there's only a few signs that she seems to understand. There are really not a lot of ways. She communicates what she wants. Signs don't make sense to her. Pictures are more meaningful. Different programs she's been in over the years have tried signing and it just has not been successful with her. She does understand a number of things you say to her and, at least we're able to communicate something.

I: Are there any shapes, colors, materials, or textures that seem to give C sensory satisfaction? Does she like to touch soft things, prefer a certain color?

M: I can't think of shapes, maybe round, something she could spin, a plate. Colors? Bright colors, red, blue, green, but not one she would choose except for a bright green when she was younger. The Fisher-Price toys have a nice bright green. She likes shiny things -- tin foil, more than anything.

I: A mirror?

M: She enjoys mirrors? She likes smooth surfaces.

I: The tuba, for example. It is shiny and with a smooth surface. Perhaps this would attract her. I can see that getting her attention.

I: O.K. That's all about C, now, a little bit about your background. Do either of you have any strong musical preferences?

M: I would say Country music mostly. It's not really loud vibrant music, it's generally quiet and that's our taste.

I: Do you listen to a lot of music in the home?

M: Yes. Because of C we really do and we enjoy it.

I: Then she is exposed to it too?

M: Yes.

I: Did either of you study music?

M: No.

F: No.

I: Do either of you either reject or dislike any particular musical or other sound?

M: Most kinds of high whining sounds.

I: Are there any musical sounds that you reject or perhaps prefer?

M: I can't think of any that I would reject.

F: No, nothing.

I: Is there a strong musical or folkloric affinity to the country of your birth or your parents' birth?

M: I don't really remember playing any Ukranian records for her. I'm from Ukranian background (father) is not but I am.

I: Would C ever have been exposed to any of the music? I know there is often a lot of family singing in Ukranian homes.

M: Very little, I think. Possibly at my Mom and Dad's, but they don't play it that often.

I: Last question. Can you suggest anything that might be helpful to me in what I'm trying to do?

F: She listened to the harmonica quite a bit. I don't know what sounds she prefers --

M: That's right. We got one last year for Christmas. She did like us to play with it. She kept wanting more of it, neither one of us was playing any tune on it, we were just sort of experimenting and she really liked it.

I: Did C ever blow on the harmonica herself?

M: She tries but she never seemed to have enough air to do the sound. We wanted it for her because we thought it would encourage her. I think it could be coming - with more work on it - she's learned to blow through a straw so the power is there.

I: I would like to see what she does with a recorder. It's very easy to blow and would take very little effort just to get a squeak out of it. I could have a harmonica there too. I would like her to feel and understand that she is producing the sound herself.

I: You have no concerns about the music sessions I'll be having with C?

M: We have no concerns. We look at it the way you described it to us. It's a way for her to enjoy music and possibly find out about other things that she does like. She has a limited way of telling us those things and it would be nice to find something for her. That's the important thing.

I: You don't think the instruments being played in such close proximity would set off any state of alarm?

M: She might not take to anything - it's hard to say.

I: Well, that's all I guess. Already a real picture has begun to emerge about her background and some of this information will be helpful.

M: She's always had a close relationship with her music. When she became so distressed it was so nice to know that playing music for her would calm her down. I don't know what we would have done without it.

I: If it's alright, we can begin next Wednesday then.

Parental-Interview: J

Interviewer: This is February 17, 1986. I am at J's home and I am going to interview her parents at this time. I'll start by asking J's age.

Mother: J is ten.

I: What is her birthdate?

M: September 22, 1975.

I: Does she have brothers or sisters?

M: One brother.

I: And that's N whom I just met?

M: That's right.

I: N's age is?

M: Eight.

I: What kind of music or sounds surrounded J during pregnancy or immediately thereafter? Playing the piano, records, anything?

M: Well, it would be records, TV music.

I: Do you remember what J's first sounds were?

M: (Pause)

I: Were they sounds you would expect from any newborn?

M: I would say so. There weren't very many. Mostly she cried.

Father: As a newborn she spent a while in the hospital because she was a month premature so the consequence was that we couldn't handle her as much as we would have liked to. The first month we don't know what sounds she might have heard.

M: Other than what she heard in the nursery. When she came home we had a mobile and she liked that sound.

I: What was that sound?

F: A mechanical 'tinkly' sound. A musical sound.

I: Like little bells?

F: Yes.

M: Later when she rolled - she really didn't crawl - when she'd roll into the kitchen my mother would always say, "She's playing the cupboard doors." One had one kind of squeak and then she'd go and squeak the other one.

I: She was attracted to the squeaking sound then?

M: She likes a mouth organ.

I: Were there sounds, voices or music of unusual nature that surrounded J during the first days of her life? We've more or less covered this but is there anything else you can think of?

M: Other than the hustle and bustle of the nursery, I can't even remember whether they had music.

F: They did have musak piped in but that was very low. It was a very sterile environment for the first month.

I: Can you describe or imitate some of the first sounds J made?

M: (Pause) Hmm.

I: Any unusual sounds?

M: No.

I: No attempt at singing or repeated sounds?

M: I think she just made the vowel sounds "ah, ee," she hasn't really verbalized. I don't feel she's really stretching her voice at all or really experimenting with it. Now she says "la." If N tries to get B (the dog) to sing, then she goes, "la." I noticed last night when we were doing dishes we were dancing to music from the radio and I was singing, and she went "la." That was the first time she did that.

I: Were there any sounds that J rejected?

M: No. I don't think so.

I: Do any sounds startle her?

M: (to father) Remember when the broom fell on the floor? Maybe that wasn't you, maybe it was my mom that was there. Anyway, something really smacked on the floor loud and J jumped and my mother said, "See, she can hear."

F: She did have what was classified as a normal startle reaction. Nothing like turning the radio on five times in a row and she would startle each time. Nothing like that.

I: Were there any other sounds that attracted her other than the cupboard squeaks that you mentioned?

M: Just the mobile. When that finished she wanted that to go back on.

F: She had the wind-up toys - the tinkly wind-up toys -

M: the Fisher-Price toys.

F: She would hold them up to you -

M: also the headphones, she would hold them up to you - she wanted those on.

I: Would she hand you the toys to wind them up so that she could attend the music?

F: Yes.

M: Yes.

I: Did you ever sing to J?

M: Yes. (laughter) Nothing that anyone else would want to hear.

I: What was her response to that: Do you feel that she attended that more than just speaking to her?

M: Yes, she enjoyed that.

I: Did you ever sing commands to her rather than just speaking?

M: No. We're not great singers in the family so we don't sing very much.

F: Sometimes a crooning lullaby and she would snuggle up to you.

I: Did J ever seem particularly drawn to music on radio, TV, or records?

F: Yes.

M: I have a "ghetto-blaster" in my sewing room and if it's not on she'll try to get it turned on. Same thing with the radio in the kitchen. She flicks the switch to have it put on. Also the earphones, she'll bring those along.

F: What program on TV does she dance to? She'll just stand there and bop back and forth.

M: Sesame Street. When she hears the music on Sesame Street she'll bop back and forth. I usually listen to country and she bops to that. Her dad listens to soft rock and stuff like that.

I: Does J seem to like both, one as much as the other?

M: Yes.

I: Does J have a preference for vocal or instrumental music?

M: I don't really think so. I haven't noticed.

F: Hmm. I would say it's more vocal. Vocal with a background beat.

M: That might be because that's pretty well all that she hears. Usually what we're listening to - our tapes and stuff like that - it's mostly vocal. She likes the bird dance and that kind of music.

I: Does J seem to prefer a man's voice to a woman's voice?

M: No.

I: Any instrument that she seems to prefer over another, a saxophone over a violin for example?

M: No. No.

F: We haven't noticed any preference at all.

I: She listens to just about anything?

F: Yes.

I: What about this bird dance song?

M: That's the bird dance where you flap your arms.

F: Accordian is the main instrument there, I guess.

F: I think she'll pretty well respond to the male or female voice or any instrumental.

M: She likes the harmonica - that's what we had until it got broken. We have a little organ - one with batteries and a small keyboard. She will plunk up up and down on it.

I: Does she ever try to match the pitches she plays with her voice?

M: No.

F: I don't think she's worked at it long enough to come to that realization.

I: How long would she spend on it?

M: Oh, that would be just a few seconds. Her attention span is very short.

I: Does she make any sounds now that resemble a musical pattern? If so, could you sing it to me.

M: No, she does not (laughter).

I: Tell me the truth (laughter).

M: That's the truth (laughter), the only thing she does is 'la.'

F: No inflection.

I: No changes of pitch like 'la' (low), 'la' (higher pitch).

M: No. But she could come by that quite naturally (laughter).

I: Do you have any special form of communication with J?

M: Mostly we just talk to her. If we want something we just ask her. We gesture -

F: try to establish eye contact. We try to use voice and eye contact and then touching. So, there is gesture, eye contact and voice.

I: What about voice inflections? What if she were doing something dangerous and you yelled at her, would she respond?

M: She would stop.

F: She freezes.

M: But then she would turn around and do it anyway.

M: She would stop initially just to see if you were serious.

I: Do you feel that she is doing that just to test you out?

M: Oh, yes.

I: Does anyone else have any special way of communicating with her, perhaps through music, bodily movements, expressions?

M: (Pause).

I: - like one of her teachers that perhaps gets through to her in a different way than you do.

M: The one difference at school is that they use sign language. We use a little at home but very, very basic. She was very quick to pick up signs but it got too confusing because there were too many around her face and she began mixing them up. She uses the bathroom sound quite a bit without it meaning what it's supposed to be. Also, if she wants food she just points to a picture we have on the fridge.

I: She identifies the food she wants?

M: Yes. Apples, oranges, bananas; a glass of milk; cottage cheese, she likes that.

I: Does she ever try to verbalize? Apple for example?

M: Not recently. The only words she's really verbalized - one is 'hair,' only the first part of it. She does say 'sa' for socks. 'Hi, Mom." Once. That must have been an error.

F: 'Car, truck, ball, juice.'

M: It was always the first part of the word. She never says the ending. We didn't know if it was because she couldn't hear it or what. 'Dad,' 'Dolly,' no, she just understood that she didn't say it.

F: There were about seven or eight words she did have. Once the sign language started the vocalization stopped.

M: Last year we asked that they not do so much sign language. That was really a mistake because then we were back at square one.

F: We tried to reinforce the verbalization but it was a step backwards.

M: Her words come and then they go, never to be repeated, so to speak.

F: The most frustrating thing is trying to communicate with her - trying to find one particular technique to communicate with her. Right now if she starts to flip and flop around she gets a lot of attention and she'll use that attention-getting device and we've got to break her out of that - but how do you do that?

I: Are there any shapes or colors or materials or textures that seem to give her sensory satisfaction?

M: She likes to get hand lotion on. She's very good at self-stimulating. She will take almost anything and put it in her mouth and click it on her teeth. For the longest time we'd have to hide the teaspoons because she would click them constantly in her mouth. She mouths a lot of things. She seems to get a lot of gratification from tasting things

M: and clicking them against her teeth. She likes new clothes - something new. When her blanket is freshly washed she'll put her face on it because it smells good. She'll take a piece of velvet or velour and rub her hands on it. She has a definite liking for those materials, different smells. She does not like anything that is terribly rough. Remember (to Father) you rubbed her hand on your whiskers and she made an awful face.

I: What about an instrument like the tuba? It is bright and shiny with a surface colder than room temperature. Do you think she'd like touching it?

F: If you were playing the instrument and she happened to touch it and she felt the resonance she just may keep her hand there.

I: To feel the vibrations?

F: Sure. She may even put her cheek on it - it's hard to tell.

M: If you put her fingers to your voice box --

I: To feel the vibrations?

F: It's one of the techniques we're trying to use to get her to vocalize.

I: Are there any concerns you have about what I plan on doing in the music sessions? You're not concerned about any of the instruments being too loud or too low?

M: No.

I: Nothing you can think of that I should be aware of?

M: No.

I: That's all I have on J. Now, I'd like to ask you some questions about yourselves. Do either of you have any strong musical preferences?

F: I have some tapes - classical, easy listening -

M: I definitely do not like the hard rock.

F: Background music.

M: It could be vocal or instrumental.

I: Do you listen to a lot of music in the home?

M: The radio is usually on all the time. Very often the TV is just on the music channel. In the car we we have the radio going - or one of the tapes.

I: Did you ever study music?

M: Yes. I took piano lessons for awhile.

F: No.

I: Do either of you prefer or reject any musical or other sound that you can think of?

M: I don't like something that is repeated over and over again. I don't like the hard rock or the punk rock or whatever they call it.

F: I don't care for that kind of music either. I like banjo music - pretty well anything but I don't like the same music over and over again. I like variety.

I: Is there a strong folkloric affinity with the country of your birth or your parents' birth?

M: We were exposed to Finnish records, my mother is Finn. Dad is Russian so he always had his records from the old country.

I: Would J have been exposed to any of this music?

M: No.

F: When I was younger - my family is Ukranian on both sides - we used to get together and sing a lot but we haven't done that in years.

I: Would J have been exposed to any of that music?

F: No. That was before we were married.

M: N (brother) sometimes sings.

I: Is there anything you can suggest that might help me as I work with J? Anything you'd like me to try or anything else you thing I should know?

M: No, I don't think so. In working with her on a one-to-one basis, she'll love it. She loves working one-to-one. I can't think of anything else. Just do what you've explained to us.

F: Just don't do any abrupt motion or force her to sit or put your hands on her to go anywhere because she'll resist you all the way. I think she's going to respond real well to this program. It will certainly be interesting to see how she does respond.

* * *

Parental-Interview: T

Interviewer: This is February 17, 1986, and I am at T's home to interview her parents. I'll start by asking T's age.

Mother: T is six.

I: and T's date of birth?

M: October 11, 1979.

I: Does T have any brothers or sisters?

M: She has one brother.

I: How old is he?

M: He is seven.

I: What kind of sounds or music surrounded T during pregnancy and immediately after her birth?

M: Before, all we ever listened to was Country -CFCW.

I: During pregnancy, then, all you really listened to was Country?

M: Yes, the radio was on all day long.

I: Do you remember what T's first sounds were?

M: Nothing different from most babies - just the usual baby sounds.

I: There was nothing of an unusual nature then, nothing that alarmed you or caused you concern?

M: No.

I: Were there other voices or sounds that surrounded T right after birth?

Father: She was in an incubator for about 3 weeks.

M: So her first sounds would have been what was in the hospital, in the neo-natal unit.

I: Did she make sounds herself? Sounds while she was in the crib --

M: Nothing that I can think of.

F: She didn't do a whole lot for four to six months. She just acted like a little doll. She made a little noise when she wanted something to eat - that's all. Then we knew that there was a problem and we sought out therapy for her.

I: Was that the first indication that you knew something was wrong - because she just lay there like a doll?

F: Oh, no. We knew from the beginning -

M: Well, after two, four days after we knew something was wrong.

F: She would turn all blue and they would put her in an oxygen tent. They took her from _____ where she was born to the Royal Alexandra in Edmonton and they found out what was wrong. She continued to get better but she was premature by about a month.

I: Can you describe or imitate some of her first sounds? Sounds perhaps that she would make over and over again?

M: I can't really remember - just what most of them do, I guess.

F: I would say not much different than what she is doing now only not as loud (at the time T was in the kitchen with us and vocalizing quite loudly).

I: Just relaxed, happy vocalizations like we hear now?

F: Yes.

I: Were there any sounds she seemed to reject or was afraid of?

F: If it was a loud sharp noise she would startle.

I: Would she cry or jump?

M: Just jump.

I: You mentioned having the radio on all the time, did she seem to prefer any one type of music over another?

F: The faster music seemed to get her attention. I noticed that but she doesn't hold her attention on anything very long. Especially on commercials where the music is louder than on the shows we noticed it would catch her attention.

M: Also, we had a mobile, one of these musical mobiles on her crib. She liked that. I turned it on for her and she liked that.

I: What would happen when it stopped? Was there any reaction whatever?

M: Not really. Not at first anyway. She might have later on made a few noises when it quit.

I: Did the mobile seem to settle her down at all?

M: Yes, she liked listening to it.

I: Would T's behavior change at all when you would turn the radio off or if a commercial would interrupt the music?

F: No difference.

I: She wouldn't react unhappily?

M: No, not really. No difference.

I: Do you ever sing to T?

M: Pause -- Yes. (laughter)

I: I didn't ask what it sounded like (laughter).

M: Yes, I did. All the lullabies and kid songs, stuff like that.

I: When would you sing to her? At bedtime if she had a tough time going to sleep?

M: No, she never had any trouble going to sleep. I would do it when I was holding her or rocking her.

I: She seems to enjoy your singing to her more than just talking to her?

M: No, not really.

I: There was no special reason to do this, it's just something all parents do and you were too.

M: Yes. She usually was pretty good so it was for no special reason or anything.

I: Did T ever seem particularly drawn to music on radio, TV, tape or records?

M: Musical toys. She likes musical toys. The wind-up stuffed animals.

I: Does she wind them herself?

M: No, she won't do anything like that.

I: Does she bring them to you for winding?

M: No, she doesn't even hold them.

I: How does she communicate to you that she wants the toy or wants to hear it?

M: She's getting now where she has a doll and you press her tummy and it plays. When it quits -

F: she giggles all the way through it and when it quits she makes an unhappy sound.

I: And that's how she communicates that she wants more?

M: Yes, she wants more.

I: I noticed in her 'circle' time at school that she gets a happy smile on her face when music is played. She appears to enjoy the music very much.

M: Yes, she likes music.

I: Do you recall whether or not her reaction is any different to vocal or instrumental music?

M: I don't think there is any difference, she listens to both.

I: Does T appear to have a preference for an instrument? Orchestra, band, rock groups, the guitars in Country music, for example?

M: No, I've never noticed.

I: T likes just about anything.

M: Really, just anything.

I: Would you say that music is one of the things that she pays the most attention to?

M: Oh, yes. It's about the only thing she pays any attention to at all.

I: Is there any song that she might prefer over another?

M: "Brahm's Lullaby" is on the mobile.

I: What about the songs played by her doll now?

M: "Rock-a-Bye-Baby." Pause -- "Row, Row, Row Your Boat."

F: There's another one on there.

M: I don't know what the other one is.

I: May I listen to the doll?

F: Sure (gets doll). The doll plays "Rock-a-Bye-Baby" (in a lilting one to a bar feeling - key of Eb, soprano recorder range), "Brahm's Lullaby" (also in Eb), "Husha" (Eb), "This is the Way We Wash Our Clothes" (Ab), "London Bridge is Falling Down" (Gb), "Mary Had a Little Lamb" (A).

F: (laughter) I never realized how many songs there were on there.

M: It seems lately that it only plays the first three over and over again.

I: T does not activate it herself?

M: No. Sometimes she rolls over on it and it will play.

I: T does not realize she has done it though?

M: No.

I: This is good to know because I can play these songs for her on the instruments I use in the testing.

I: When you sing to her does she respond to the words at all?

M: No.

F: Only that it's a noise and she looks to see, that's all.

I: If she is in the room and you turn on the TV or radio, will she cease what she is doing and seek out the sound?

M: Yes, she will look at me.

F: With the TV she will go right up to the speaker. The radio plays all through the house so it's hard to tell.

I: Does T try to feel the vibrations on the TV speaker?

F: She does put her hands on the TV.

I: So, perhaps she is trying to sense the vibrations.

F: She does touch it.

I: I do want her to experience vibrations by touching some of the instruments as I play.

F: (T came into the kitchen) Let's push this (the doll) and see what happens. (Husha)

T: a high pitched squeal followed by an outburst of high vocalization.

I: T is responding happily to the music?

M: Oh, yes.

I: Well, I'm going to play those songs for her on the tuba and the saxophone and the flute and the trumpet and see what happens.

I: Does she make any sounds now that resemble a musical pattern? Like the sounds she is making now. Does it ever sound as if she is trying to sing a song, even if it's just two notes that change pitch?

M: Not that I've noticed.

F: No.

I: So, as far as you know, she's never really tried to sing a melody?

F: Sometimes we think she's trying to say Mom or Dad.

M: Whether it's that or not or whether we just think it is, I don't know.

I: Do you have any special form of communicating with her?

M: She has her ways of letting you know what she wants.

F: If she comes to the kitchen you know she's got to have something to eat. If she wants a drink, she'll stand by the fridge or over by the sink.

I: Does any other person have any special way of communicating with her, perhaps through expression, bodily movement, signing --

M: No.

I: Are there any particular shapes, colors, textures or materials that seem to give her sensory satisfaction?

M: She likes soft things.

F: She likes the sound of water running very definitely. She likes to get in it and splash around.

I: Do you feel that she would like to touch any of the instruments?

M: She's beginning to touch quite a bit now, the stove and the fridge and she touches the walls.

I: Does she touch the fridge or the dishwasher, for example, during operation? Do you think she hears the motor or feels the vibrations?

F: I think she gets the vibrations from the floor.

M: She does touch the dishwasher a fair amount when it's going.

I: Does T ever sing herself to sleep?

F: She makes noises just about all the time when she's happy - very high pitched noises when she's excited.

M: She giggles a lot when she's going to sleep.

I: What if she's fearful or disturbed about something?

F: She cries out in a very authoritative voice that something is irritating her.

I: And if she's happy and calm?

F: She makes noises like this (punctuated cooing sounds).

I: Is there anything in her medical background that you would like me to know as I plan the music sessions with her?

F: Nothing more than we've said. We were told she'd always be sick. She has a weak immune system and is always getting colds - T, you're going to tumble, look out! (T approached the stairway, but did not attempt to descend).

I: I'd like to ask some questions about you as parents now. Do either of you have any strong musical preferences?

M: All we listen to is Country.

I: You don't like Rock or Classical, easy listening?

F: It depends on the day.

M: Usually it's just Country.

I: T would be exposed to this then?

M: Oh, yes.

F: From seven in the morning until we go to bed it's piped through the house.

I: Did you ever study music?

M: I took the guitar for awhile. That was before T's time.

I: You didn't play it during pregnancy?

M: No.

I: Did you study music at all?

F: Yes, in school. Flute, I guess it was called.

I: Do either of you reject any musical or other sound?

M: No, not really.

I: Any particular sound that you do not like?

F: No.

T: (came to me and I took her on my lap).

I: We're going to have a good time with those instruments.

I: Is there any folkloric or musical affinity with the country of your birth or the country of your parents' birth? I'm speaking of ethnic music. Pause -- Were you both born here in Canada?

M: Yes, we were.

I: No strong ethnic influence insofar as music is concerned?

M: Neither side?

F: No.

I: Nothing that in any way might have affected T?

M: No.

I: Is there anything you can suggest that would be helpful to me in working with T? No concerns?

M: Nothing that we can think of that would bother her.

F: No extra loud music. She'll be sleeping and you can open her bedroom door and she'll jump.

I: Oh really?

T: (begins to squirm in my arms and wants to get down. I put her on the floor but she returned to me to be taken on my lap again. She cuddled up to me snuggling her head into my neck, all the time making happy cooing sounds).

F: We were at the hockey game not too long ago and it got pretty loud and she got scared so we took her out. She still didn't calm down so we took her to the car.

M: She looks real happy (in my lap).

F: She heard the horn from the bus this morning and was all anxious to go.

I: So she recognized the bus horn and knew she was going to school?

F: Yes.

I: Are there any other cause-effect relationships that she seems to understand? For example, if the microwave rings, does she know the food is ready?

M: Oh, yes.

F: She'll stand right there getting more excited until she gets fed. She comes running when she hears water. If I go out the door, she'll come running and stand right there until I come back in.

I: Well, you've been very helpful. Thank you for your time. I hope I'll be able to do something that will bring some joy and enrichment to her life.

* * *

Participant-Observation

Change of almost any kind, whether it be change in routine, change in environment, change in method, or the intrusion of a new person in the life of an autistic child, is frequently met with perplexity and often with great disturbance or alarm. Because a salient characteristic trait of autistic children is a resistance to change and an almost obsessive insistence on maintaining sameness, observation of the three autistic children involved in this research study was carried out in an environment that was familiar to them, their homes and their school. To actively participate with these children in their own natural settings, settings familiar and non-threatening to them, would at one and the same time allow for the maintenance of environmental sameness and also, enable me to slowly and unobtrusively infiltrate their 'lived experience' without causing sudden, shocking or alarming changes to them.

The purpose of the participant-observation phase of the study was firstly, to gain the acceptance of the children - to become their friend - and, secondly to learn more about them through vigorous and careful observation. I wanted to spend enough time with the children so that they would feel comfortable and be natural while I was in their presence. I did not want my being with them to mediate or modify their behavior in any way during the music sessions - the participant-performer-observation phase of the study.

Observation began in January, 1986. A number of telephone conversations with the Educational Coordinator of Grand Valley School to introduce my research project and to express my desire to use Grand Valley School as a research site, led to an invitation to the school on January 29, 1986, to view the building, meet the teachers and to observe the students. To my very pleasant surprise, the Educational Coordinator had aleady explained my research proposal to the staff and to the parents of the autistic children enrolled in the school. All, including parents, teachers and administration had given approval to usage of the Grand Valley School for my study. Both parents and teachers, I was told, were enthusiastic and anxious for the musical sessions to begin with the children.

Even before I was prepared to distribute parental consent forms, the parents of C, J, and T, had already assured the Educational Coordinator that their children could be involved in the research project. Such willing cooperation was most encouraging to me as a researcher. The anxious anticipation of the parents also impacted my life in a very sobering manner. The parents' hopeful anticipation that here, finally, might be something that reaches their child brought into sharp focus, once again for me, the enigma of autism and the frustrating avenues and dead-end streets that parents often travel in search for something that may break through the autistic shell of their child. The ready willingness of the parents to involve their children is also indicative of their desperation. They appear ready to grasp at any new research approach that in some way might provide the missing link to the mystery of autism.

After a final meeting with the Educational Coordinator to delineate the time line of the research and to discuss the medical and educational history of the girls to be involved in the study, we went together to the classroom. Here I was introduced to the teachers and teacher aides who work with C, J, and T. I observed a class 'circle,' a daily educational procedure designed to teach the children language, communication, motor and social skills. This particular morning class regularly consists of J and T, as well as four other non-autistic children, some of whom have one or more severe mental and/or physical abnormalities. This particular class is the beginning primary class in the Early Education Program of Grand Valley School. C attends the afternoon class which is for higher functioning children but is still within the Early Education Program of the school.

Participant-observation began two weeks later at which time I had my first communicative contact with both J and T. Description of my initial contact with C is later reported.

The data from the participant-observation phase of the study are presented below (for Observation Schedule, see Appendix VIII).

Observation of J

Wednesday, February 12, 1986, 9:00 a.m.

Today I met J and T. No participation. I observed the teacher as she lovingly worked with the girls and three others in the class 'circle.' I am impressed with the clean, bright and cheerful ambience of the room. Although only a detached observer today, I notice J's interest in me. She looked into my face - studied it. "Hi, J," I said. "I'm Paul" (placed my hand palm inward on my chest), "and you are J," placing my hand in gentle grip on her shoulder - a friendly gesture of touch to indicate that I was talking especially to her and about her. (But also to find out if she might be tactually defensive). She laughed gleefully and began to self-stimulate by flapping her hands. I held her hands down and said, "no, J." She ceased. J walked to me and extended her hand to touch my arm. I took her hand and made caressing motions on my arm. More gleeful laughter

> and self-stimulation. J was summoned back to the class 'circle.'

J's friendly and open overture to me in this our initial meeting was most encouraging. A response such as this at the very outset of the participant-observation phase of the study led me to believe that a protracted participant-observation would not be necessary. A further excerpt from my journal reinforces this perception.

> Wednesday, February 12, 1986
>
> Washroom break. J was brought back into the classroom from the washroom and stared intently at me. Suddenly, as though recognition had dawned, J smiled with delight, hands flapping in wild excitement.

I perceived then and there that J and I were friends.

Observation of T

T was suffering the effects of an anti-seizure drug which she had just begun taking the day of my initial observation in her classroom. The drug made her drowsy, lethargic and quite unwilling to engage in the activity of applying bright red paint to some pre-cut Valentine hearts on the table. My field notes reflect on T's lethargy.

> Wednesday, February 12, 1986
>
> I took my place at the table next to T, who seemed oblivious to my presence and resistant to the teacher aide who manipulated T's hands and arms in an attempt to get her to hold the paint brush by herself. No success!

The teacher informed me that T was not generally so inert but usually more outgoing. Her lethargy was attributed to the new drug she was taking. The drug's debilitating effects were expected to lessen as T's body assimilated and then adjusted to the medication.

The following journal entry reveals T's oblivion to her environment but also reflects on my assessment of the potential power of music to influence her in a positive manner.

> Wednesday, February 12, 1986
>
> T seemed oblivious to all that was going on in her environment but did produce what I perceived to be a happy smile each time the music was heard from the tape. Hopefully, one of the instruments I play for her will help her respond to me. I will employ some of the melodies from her classroom tape in an attempt to reinforce musically what her teacher is doing in the classroom 'circle.'

The adverse effects of T's medication gradually diminished to the point that she became quite alert and attentive in the class 'circle.' Still, at times she seemed almost oblivious to what was going on around her and what was desired of her during the 'circle' time. There was very little response to any of the motor movement activity suggested by the songs being played on the tape. A smile did appear each time the music began but there was little to no response to the activity required. I took her arm, or leg, and made the movements for her as required by the song, i.e., 'clap your hands,' 'stamp your foot,' 'brush your hair.' I sensed an acuity for sound (pitch?) that was evidenced when the hand vibrator was turned on. The vibrator makes a monotone hum which has a recognizable pitch (Bb). T was aware of the sound and attended to it well before the machine was touched to her body to give her tactile stimulation. An excerpt from my field note journal records T's reaction to this sound.

> Friday, February 14, 1986, 9:00 a.m.
>
> A definite smile appeared and remained on T's face when the hand vibrator machine was turned on. Although she was initially somewhat defensive when the vibrator was put on her knee and then her stomach, she seemed to enjoy the vibratory stimulus the second time the machine was touched to her knee and then to her stomach. Although enjoying the sound of the motor from the time it was turned on and, finally showing a happy response to the vibratory stimuli, there seemed to be no cognizance of cause-effect relationships. There was no apparent awareness that the vibrator was producing the sound that was pleasing her, nor, that it was the vibrator that created the vibratory sensation which brought a smile to her face.

T attended to a mirror for thirty seconds and smiled when the teacher sang to her about looking at herself. Later, during a lull in the 'circle'-time activities, T, on her own, got out of her chair and walked up to where I was sitting. She stood very close as if to say 'hold me.' I picked her up and put her on my lap. My journal entry reflects my happy surprise that a tactually defensive child would manifest a desire for affective physical contact.

> Friday, February 14, 1986
>
> T came to me on her own and stood very close (wanting a hug?). I took her on my lap and she snuggled up to me, her cheek on mine and then cuddled her head into my neck. She manifested no tactile defensiveness whatever and presented no bodily borders of defence. In fact she snuggled right in and made herself cozy.

I could ask no more in this phase of my research. The participant-observation level of the study was designed, in part, to allow for the development of a friendly and relaxed relationship between the girls and myself. Like J before her, T and I, I felt, had already begun to establish a positive interpersonal relationship.

Observation of J

Each time we met during a new participant-observation session J would initially study me by looking intently into my face with good eye contact. Upon recognition of me, she would self-stimulate and smile broadly, thus indicating to me that she was both excited and happy to see me.

An insert from my journal reflects on J's reaction to my presence and also to some of our interaction as I participated with her during the 'circle' time.

> Friday, February 14, 1984, 9:00 a.m.
>
> Sat next to J in the 'circle' already in progress, and she seemed immediately to recognize me and smiled and began to hand flap. As the actions from the taped songs were called (sung) out, J anticipated a number of them, i.e., sleeping, clapping and stamping, yet made no attempt to do other actions even when I helped her by moving the appropriate part of her body in accordance with the taped music.
>
> Upon occasion, usually because I was observing T in the same 'circle,' I did not act out the required actions from the musical tape. J would look disapprovingly at me as if to say, "why aren't you doing it, too?" When I did respond to the actions, J looked pleased and would smile and/or self-stimulate by hand-flapping. Lots of eye contact and looking for my approval each time she reacted to the teacher's and/or tape's request, I always responded with a firm-voiced "Good, J." Her response was invariably a smile and/or hand-flapping.

A later journal excerpt records evidence of the relationship between myself and the girls.

> Observation of J and T
>
> Wednesday, February 19, 1986, 9:00 a.m.

> J, very aware of my sudden entrance in the room, began to hand-flap and smile broadly. She brought me a ball and we played with it for nearly two minutes. We exchanged the ball several times by handing it back and forth but she lost interest when I threw it lightly to her and it fell to the floor. I was surprised at the extended attention span. J then brought me a jack-in-the-box and squealed with delight when 'jack' popped up. She responded when asked to turn the crank herself and again laughed heartily when the 'jack' sprang up. J frequently smiles at me. I feel that we are friends.
>
> T came over to sit on my lap. This is the second time she has done this. Again, she snuggled up to me and put her cheek to me. Not at all defensive. We are no longer strangers. T feels secure with me in her presence.

A later visit in T's home saw her repeat the same activity. Both parents were pleased that she manifested such affective behavior. During this visit I heard the musical doll which T enjoys immensely. Although she has not learned how to activate the music herself by pressing the doll's 'tummy,' she listens to the music frequently and, according to her parents, is very often lulled to sleep by the musicbox-like sounds. After learning of T's fascination with the doll's music, I noted the tunes that were played and decided to employ them during the course of our music sessions together.

Observation of C

C and I met for the first time in her home. I was met at the door by her parents. C stood shyly beside them and showed no response when I greeted her with a "Hi, C." Although there is often no overt observable response to my greeting, I do believe that the initial meeting with an autistic child can greatly influence subsequent encounters with that child. Even when autistic children cannot comprehend the meaning of everything that is being said to them, they often are very perceptive in their interpretation of the manner in which they are spoken to. Inflection, intonation, timbre (tone quality), firmness, confidence and clear articulation can all be assets in communication with them (Alvin, 1965; Oppenheim, 1974).

In all my communicative attempts with autistic children I try to speak lovingly, firmly, clearly, and with confidence. In my initial contact with each child I use a greeting from which can be fostered a more in-depth relationship. After greeting C, who was from all outward appearances, unresponsive to me, I greeted her again by saying, "Hi, C, I'm Paul." I repeated "I'm Paul" and in so doing placed my hand, palm down on my chest, to indicate that I was speaking of myself. I then said, "You are C," placing my hand in like manner on her chest, thus indicating that I was speaking especially to her and about her. I then said, "we're going to be friends." This brought an immediate, albeit very short, smile to her face. We were communicating.

Hopefully, from my vocal style, the children perceive that I love them, that I am confident in my relationship with them and that there is to be a seriousness of purpose underlying our interaction. By touching them, I trust that they sense that I am not afraid to touch them, even if they are tactually defensive, that I will touch them gently, just as gently as I touched myself, and, that there is a deeper communicative meaning embedded in physical contact. Touching the children with the instruments in order to allow them the experience of various modes of sensory stimuli from the instruments will be part of the participant-performer-observation phase of the study. Acceptance of tactile modes of stimulation are, therefore, important from the outset.

My journal notes speak to the effectiveness of this approach with C.

> Wednesday, February 19, 1986, 8:00 p.m.
>
> C played with bottles in the refrigerator but frequently interrupted her play to approach me. Each time she stood near I would repeat the greeting from which I wished to build a meaningful relationship. "I'm Paul (placing my hand on my chest). "You're C" (placing my hand on her chest). "We're going to be friends." She appeared to be intrigued with the message I was trying to relay to her. She was especially attentive when I kept repeating my name, "I'm Paul, can you say Paul? Paul, Paul." There was eye contact, attentiveness and an apparent desire to grasp and to do what was being asked of her. This was very real and her apparent desire to comply made an impact on the parents. Both said that C's attentiveness and concentration extended beyond what was characteristic of her.

C's mother and father were anxious to have her begin the musical sessions. Because C's reaction to me was friendly and open, both parents felt that no further observation was necessary. Music sessions with C would begin in one week.

Participant-Performer-Observation

The actual music sessions took place during the participant-performer-observation phase of the study. Stringency and exactness in description were the objectivesin attempting to describe each of the children's responses and reactions to the musical stimuli. The following data collected from this phase of the study and presented below, describe the actual music sessions with each child. The attempt to record chronological flow, assess causes, and derive relative and meaningful information was done by stringently describing each session in my field note journal. Immediate overt response was recorded during each session on the Observable Response Charts by checking off the appropriate reaction resulting from the sound of the individual instruments. Questions, comments and reflections of a personal nature were also recorded and are occasionally noted herein as they are pertinent to the study.

The purpose of the musical auditions, as mentioned earlier in the dissertation, is threefold:

1. Diagnostic: to diagnose the child's ISO sound and to use the instrument(s) that produces that sound as a nexus for communication with that child.

2. Therapeutic: to use the instrument(s) therapeutically, that is, to use the instrument(s) to draw the child into deeper interpersonal relationships and more communicative contact with his/her world.

3. Educative: to use the instrument as an educative tool; to entice the child to respond in some way to it; to manipulate the keys or valves him/herself; to try to play the instrument; to allow the child to experience tactile, visual, and auditory modes of stimulation; to engage the child in gross and fine motor movement; to increase the child's awareness of cause-and-effect relationships.

Descriptive Data Relative to C

Clarinet-Bass Clarinet

The following excerpt from my field note journal explaining C's response to me at our first music session verifies the importance of establishing a secure and friendly relationship before beginning music sessions. Forming a bond of understanding, if not friendship, allowed me to be part of C's milieu as a participant-performer-observer without modifying her world to the point of causing undue concern or alarm.

> February 26, 1986 11:00 a.m.
>
> I was already in the room as C was brought in by her mother and a private tutor who had come along to observe. C made eye contact with my face immediately. "Hi, C. May I have a hug?" No hesitation whatever. C came to me and put her cheek to mine. "Wow," said Mom, who was surprised at the immediate and affectionate response of C.

Audition of the instruments began after C's mother and the private tutor left the room to observe the proceedings from behind the one-way glass in the observation room.

> No overt response to the clarinet. C continued to search the floor for things to pick up and put in her mouth as I played the clarinet. An abrupt attempt to cover her ears as I played loudly in the high range of the instrument. I quickly changed to a lower register and C dropped her hands. This was followed by almost undivided attention as I played extemporaneously, changing dynamic levels, registers and tempos. I could not determine what component of music grasped her attention for those two minutes. C walked to a desk in the room and began ritualistic play with a toy clock on the desk. A change to the bass clarinet elicited no observable response. I then went and sat directly in front

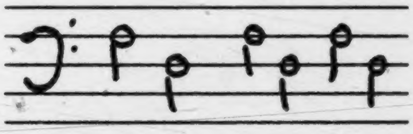
> of her and played. C continued to play with the clock. "Happy Birthday" on the bass clarinet brought an immediate behavior change. C smiled with delight, ceased playing with the clock and gazed into my face as I played. There were several outbursts of laughter and then a return to playing with the clock. I went to the other side of the room, playing as I went. C made no attempt to follow or locate the change of direction of the sound. A repeat of "Happy Birthday" brought no response. A sustained low F at a high intensity level modified her behavior and brought her to rapt attention, although she did not seem to care or realize that the sound was coming from behind her. She did not turn around but ceased playing with the clock and stood listening very attentively as I sustained low F, E, and Eb. C did not move but gave what appeared to be undivided attention to these sounds.

My thoughts of the phenomena are reflected in my personal feelings and questions.

> I feel that these three tones have come as close as anything to being empathetic to C's ISO sound identity. Could it be that these full resonant tones of the bass clarinet, tones which seem to fill the whole room, give C a feeling of fullness, of plentitude?

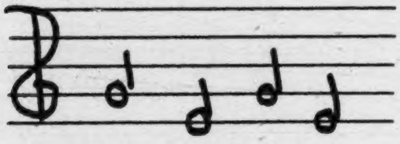
Further description in my field notes indicate C's interest in the instruments.

> I played

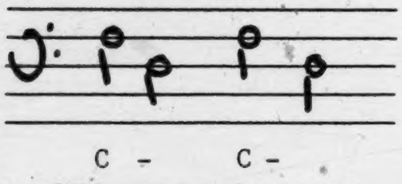


> several times and then sang C's name to the same pitches. A smile came to her face as I touched her shoulder after playing and singing her name to these two pitches. I sat in front of C at the desk with the bass clarinet and played C's name theme

Bass Clarinet



Concert pitch sung



over and over again, each time followed by the singing of her name, one syllable to each note. C gazed into my face in deep concentration, made some guttural sounds as though she was trying to communicate her understanding of what I was wanting her to do, to sing (say) her name, but was just unable to respond. I praised her for her good work and retrieved the clarinet as C began again to play with the toy clock. The clarinet fascinated C and I placed the bell on her stomach and played the lower notes so as to enable her to feel the vibration from these tones. Upon sensing the vibrations, C began to manipulate the keys. I played up and down the C scale at rapid tempo, exaggerating my finger movements so as to enable C to simultaneously sense auditory and visual change. Coupled with the tactile sensation of feeling the vibrations, I wanted C to recognize cause and effect, i.e., change of sound due to movement and change of fingers. After about forty-five seconds of playing with the keys and attending to the sense of vibration from the bell, C pushed the clarinet away from me. She was not pushing the instrument away from her but away from me. She then walked up very close to me much the same way any normal child would who desired a hug. I began playing the clarinet again, and again C pushed the instrument in a direction away from my own body. She had a look of disapproval. At that point I perceived that C was jealous of the clarinet. She wanted my undivided attention. I hugged her. She stood close to me and molded to me. C presented no bodily borders of defense.

After the session ended, the mother, who observed the entire session, told me that she too, sensed that C was jealous of the clarinet and wanted it out of the way. "Quite a way you have with her," she said. C's mother was very pleased with the long attention span during the course of the session. To be attentive for so long a period was most unusual, according to the mother.

Recorder-Flute

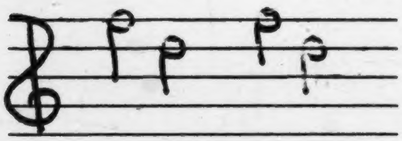
March 19, 1986   11:00 a.m.

C entered the room with her mother and stood shyly before me. When asked for a hug, C, without hesitation, kissed me and placed her cheek on mine. She became defensive when I attempted to hug and kiss her. C's mother then left the room to observe from behind an adjoining wall.

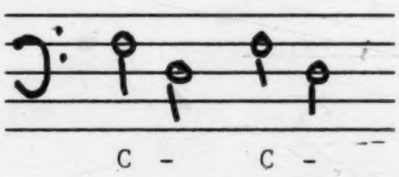
C immediately located a dish and occupied herself by putting it in a waste basket and retrieving it. C repeated this ritual over and over again. There was no cessation of this activity when I began playing the flute in back of her. Her body language seemed to indicate however, that she was listening to the music. C's mother, who was observing from behind a wall, thought that C, although showing no overt response, was very much aware of the flute sounds and was definitely listening. Several times C ceased her ritualistic play with the dish and stared blankly out the window as if concentrating on the sound. When I stopped playing, C continued her activity with the dish. This was not consistent, however.

The playing of C's name theme

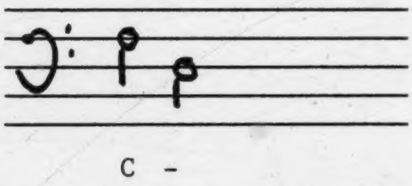
Flute



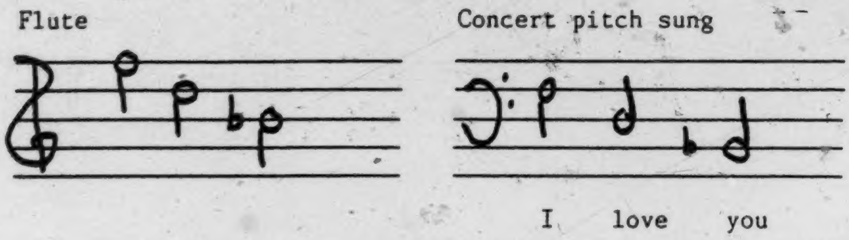
Concert pitch sung



over and over, followed by the singing of her name to these pitches, one pitch for each syllable of her name,



elicited a deep throated rumbling as C sat on the floor. She repeated these seemingly non-sensical vocalizations, an activity not uncommon for C. However, at this point these sounds centered on a very definite pitch (Bb). The pitch was maintained for nearly thirty seconds as C repeated this mumbled, punctuated vocalization. The key of B flat was very clearly established through my repetitious playing of the "I Love You" theme.



> C was responding unwittingly, or perhaps with cognitive awareness, with an acuity to key and pitch that was both surprising and encouraging. C darted across the room to play with some tinkling ornaments hanging from a lamp. This play seemed half-hearted. C's body language did not seem appropriate to the activity. C had her head tilted to one side as if listening intently to the flute, although continuing to play with the ornaments. She quickly tired of playing with the tinkling ornaments, perhaps because I played the F-D interval over and over again followed by the singing of her name to these pitches. There was direct eye contact several times as C looked directly into my face, but she made no attempt to imitate the pitches or the singing of her name. C returned to the dish and began to play with it. While her back was to me, I began playing the recorder. A quick and abrupt tilting of C's head indicated to me that she perceived a difference of timbre and/or compass between the two instruments. She had been listening to the flute for fifteen minutes. A sustained high G on the recorder evoked a guttural sound from C and she raised her right hand to cover her ear. Other than these two reactions, C seemed oblivious to every other sound produced on the recorder. I began playing the flute again and three times during the audition of the flute, C ceased her ritualistic behavior with the dish. Her facial expression modified, and with clear-eyed intensity, she gazed directly into my face as I played. I extended the flute to her and she wrapped her hand around the lower joint of the instrument. She quickly discovered the hole in the end of the flute and proceeded to put her finger in the hole. This fascinated her for about twenty seconds. The playing of "Happy Birthday" elicited no response whatever.

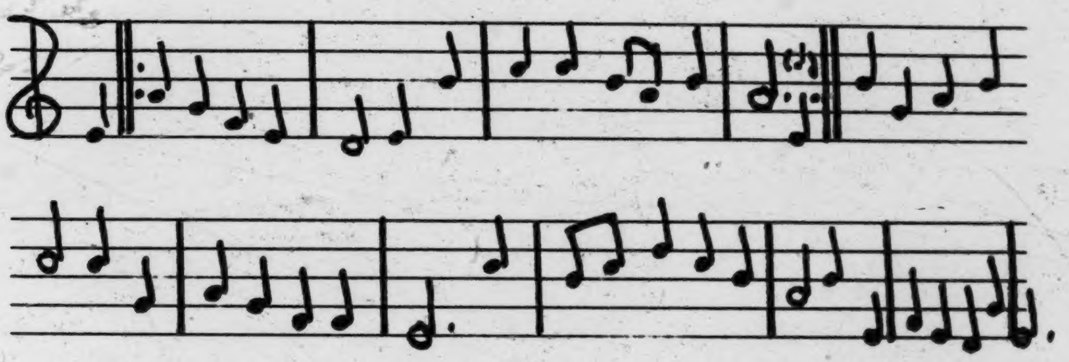
I recalled C's gleeful and positive response to the playing of "Happy Birthday" on the bass clarinet and I was very anxious to observe her response to "Happy Birthday" played on the flute. My personal reflections are recorded as follows.

> Perhaps the gleeful response to the playing of "Happy Birthday" on the bass clarinet was not so much a recognition

of the tune as it was a tapping of the ISO principle through tone, the timbre of which was empathetic to C's internal sound identity. Could it be that the resonant timbre of the instrument created a rupture in the autistic shell and C was allowing her new-found joy to be projected outward? If her joyous response to the bass clarinet was due to the recognition of the tune, would not the playing of it evoke the same response from the flute?

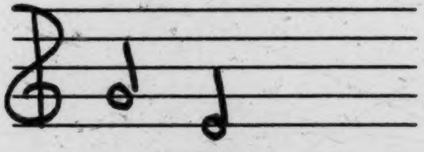
The description of C's nearly inaudible imitative response to her name theme was recorded as follows in my journal.

> I sat C on the sofa directly in front of me as I played the following Bach Chorale (O Sacred Head Now Wounded).



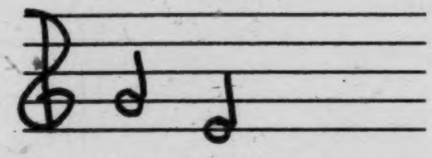
> C attended well with good eye contact and clear, searching expression on her face. The last two notes of the Chorale (G-E) were played contextually and then repeated over again to C's name theme. Her body twitched and she made guttural sounds and appeared as though she desperately wanted to respond but could not. Her mannerisms and actions, although lacking a look of desperation and panic, were much like that of a person who is choking and wishes to communicate verbally but cannot. I played

Flute



> again and sang her name. Very softly, in almost inaudible tone, C responded with a muted hum.

Concert pitch sung by C

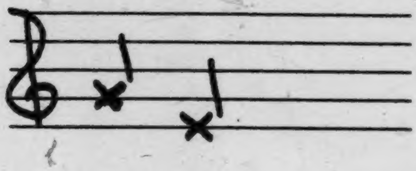


The sounds were both tonally (pitch) and rhythmically accurate - an exact imitative response. C's mother and I stared at each other in astonishment. C did not repeat the imitation although I tried to get her to do so by repeatedly playing and singing her name theme over again. C got up from the sofa and walked past me. As she did so, I extended my arm and hugged her. There was slight defensivity, but I sensed that the resistance was half-hearted, so I maintained my hold around her waist. C apparently perceived that my hold on her was a demonstration of affection, was something that I took seriously, and was something I was not going to give up on easily, for she quietly backed up to me of her own volition. C's mother was both pleased and amazed to see the attenuation of C's usual tactually defensive behavior. Upon releasing my arm from her waist, C lunged at me in an abrupt manner and put her mouth on my cheek, sniffing it in the process. As C stood near my chair, very attentive to what I was doing, I seized the moment to play rapid scales up and down the flute with greatly exaggerated finger movements in hopes that simultaneous visual and auditory stimuli might help her define cause-effect relationships. Allowing C to touch the flute again after this display saw her touch it in a much more refined manner than before. Instead of clumsily grasping the entire lower joint of the flute, in full-handed grasp as before, C felt the keys, studied them, and began to manipulate them individually. Time and again C would push the flute toward me when I ceased playing. C was most certainly communicating her desire to have me continue playing. C was fascinated, too, with the clicking of the keys.

To depress the keys on a woodwind instrument (no blowing) quickly and forcefully generates a popping sound with identifiable pitch to each key as it is depressed. C studied this movement with rapt attention.

I took advantage of C's attention to this phenomenon to reinforce her name theme

Flute (popping keys)



by popping the G and E keys on the flute, the result being popping sounds with identifiable pitches which C has heard repeatedly on four different instruments to this point.

After the long forty-five minute session, C's mother remarked about C's attentiveness and concentration, both of which extended beyond the usual span characteristic of her.

Trumpet - Tuba

Data abstracted from the parental-interviews and the teacher-questionnaire indicated that C shows considerable interest in objects that are bright. An awareness of C's attraction to things such as bells, shiny toys and tin foil, aroused my interest and curiosity about what C's initial reaction would be to the bright, shiny tuba. Excerpts from my field note journal describe C's reaction.

March 26, 1986 11:00 a.m.

C and her mother were waiting in the hallway as I set up the instruments in the observation deck, a small room with two chairs and a table in the corner. I placed the trumpet in its open case on the table and I held the tuba on my lap in playing position but did not play the instrument. I wanted to observe C's reaction to the largest and shiniest instrument that I would present to her. C's mother helped her remove her sweater and then sent C in the room with me, closing the door behind her. C's interest in the tuba was immediate. Her interest was manifested by a curious exploration of the instrument. She felt the smooth texture of the lacquered finish and caressed the smooth surface of the bell. C ran her fingers around the circumference of the bell and reached her hand deeply inside, feeling the circular contour of the bell's opening. C was very obviously sensitive to the stimulating effect of touching

> the tuba's smooth surface, and was deriving pleasurable tactual stimulation.

Further information from the parental-interview pointed to the fact that C, although often attentive to music sounding from the television, was oblivious to the picture images being portrayed on the screen. Being aware of C's lack of awareness (perhaps elected evasion) of picture images prompted me to present opportunity for her to notice her own reflection in the tuba. The following excerpts describe C's avoidance of (unawareness of) looking directly at her own image.

> I tilted the tuba to C's level so that she would be able to better reach into the bell. As C moved to the front of the instrument, I positioned it in such a way so that her gaze was fixed directly on the large shiny area of the bell. C either avoided looking at her reflection or was unaware of its existence. Several attempts to stimulate an awareness of her image reflected from the shiny tuba's surface were unsuccessful.

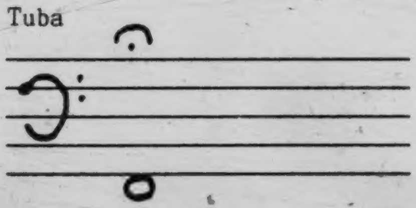
Over the years, literally hundreds of normal children from many different countries and heterogeneous cultural, social and linguistic backgrounds have amused themselves (and me) by watching their own reflection in my tuba as I demonstrated it for them. My wonderings as to why C, impaired with the enigma we call autism, could not or would not, enjoy such a simple pleasure as looking at her own reflection in the tuba, are translated into personal questions as follows.

> Does C's refusal to look at herself represent an active negation of selfhood? Some psychoanalytical theorists purport that, because an autistic child does not interact socially, their "self" does not emerge. Is C's refusal to

> look at herself a denial of the existence of self? Is this a deliberate shunning of self recognition? Or does it reflect an inability to comprehend, an inability to conceptualize the meaning of selfhood both in herself and others?

The immediate purpose of this musical testing with C is to find an instrument with a sound that is empathetic with her ISO sound identity, to isolate a preferential sound which will draw her out of her autistic shell and into some form of meaningful communication with her environment. The following excerpts describe how I very subtly introduced the tone quality of the tuba into C's lived experience, thus coupling simultaneous auditory sensation with C's aleady existing tactile and visual modes of sensory perception relative to the instrument.

> For close to four minutes C continued, without interruption, to explore the surface of the tuba, running her hands over it and caressing the smooth, shiny surface. She extended her hand into the bell several times. C's interest peaked when, while reaching deeply into the bell, I began playing a sustained 'pianissimo' F.

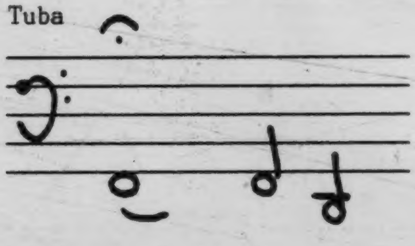


> Although I could not see her facial expression due to the fact that her head was obscured by the bell of the tuba, I sensed a deeper curiosity, an awakened interest. C pulled the instrument downward and toward her so as to enable her to peer into the bell in search of the source of the sound. C put her head right into the bell as if wanting to more fully sense the tone. Perhaps, too, she was sensitive to the vibrations of the instrument. I continued to sustain this one pitch as softly as I could play for I did not want to frighten her with an uncomfortably loud sound with her head directly in the bell. C contented herself with

listening, head in bell, for thirty seconds.

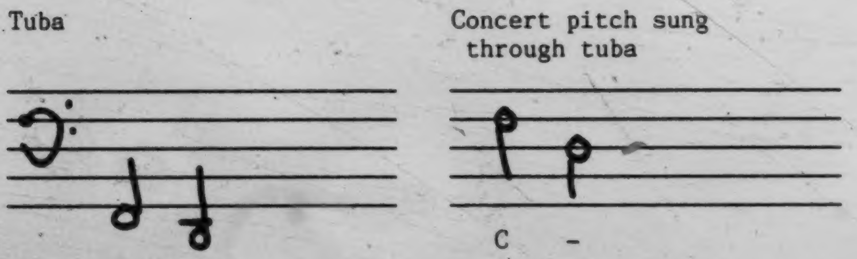
The conceptualization of cause-effect relationships in autistic children is developed very slowly, sometimes not at all. An incidental occurrence with C indicated to me, her potential to develop this concept. This occurrence is recorded below from my field note journal with intermittent explanatory remarks.

> With head in bell, C continued to listen to the repetition of sustained 'pianissimo' F's. I played C's name theme softly.



This theme had been played to C on the clarinet, bass clarinet, recorder and flute, most often played using the same two pitches, F-D, albeit in higher octaves on the clarinet, flute and recorder, due to the different register limits of those instruments.

> I played C's name theme again followed immediately by the singing of that theme through the tuba mouthpiece.



The mouthpiece of the tuba is large enough to enable one to mouth words into it without removing the lips. I have used this technique as a ploy (in mock seriousness) upon numerous occasions to entice children to look into the bell of the tuba in search of the 'little man' who lived inside. The response of the children is invariably a credulous search for the 'little man' in the cavernous bell opening, or, a quick, suspicious questioning look cast in my direction to see if indeed it was I who had done the talking through the tuba. C's quick response was not unlike the latter reaction in normal children.

> Upon the playing and singing of her name theme, C abruptly removed her head from within the bell, pushed the tuba aside very quickly as if trying to catch me in the act of talking (playing) through the tuba, and looked directly and intently into my eyes, head tilted a bit to the right. Had C not been autistic, and presenting a number of cognitive deficits, I would say that her reaction was much like the reaction of normal children. It appeared as though her conceptualization of cause-and-effect, at least in this instance, was fully developed. As I continued to play the tuba C put her head in and out of the bell, listening, enjoying, laughing and making guttural noises in her throat. I perceived that this might be an attempt to imitate the tuba sounds by singing so I talked to her and encouraged her to sing (say) her name. Over and over again I played and sang C's name theme and I felt that there were definite attempts to respond. The desire seemed to be there but the function was not. For fifteen minutes C's undivided attention was fixed on the tuba except for a brief examination and touching of the trumpet lying in open case on the table. C did attempt to pick up the trumpet but I dissuaded her. C went to the door, opened it, and went out to her mother who was waiting in the hallway. I remained in the room and began playing the tuba after C had disappeared around the corner. C came on her own volition, entered the room and watched as I played rapid scale passages with exaggerated finger movements so as to enable her to see and hear and perhaps be lured into engaging in motor activity by pushing the valves herself. C did reach out and began to manipulate the valves. I continued to generate sound on the tuba hoping that she might sense that by depressing the valves, she herself was causing the change in pitch. C tired of this activity and began to play with the door handle. I played "Happy Birthday" but did not get any significant response, certainly nothing like C's response to

the playing of "Happy Birthday" on the bass clarinet. The sustained F's at the beginning of this session held C's interest and attention in much the same way the sustained low F, E and Eb did on the bass clarinet. I placed the tuba on the floor and began playing the trumpet. C was not at all interested. Her interest was fixed only on the tuba which rested on the floor. C pushed the valves and caressed the surface of the tuba with her fingers. The more I played the trumpet, the more agitated C seemed to get. Her name theme played and sung evoked no reponse nor did "Happy Birthday." C looked up at me from her position next to the tuba and pushed it in my direction. C was communicating her desire to have me play the tuba again. I retrieved the tuba and began to play. This seemed to satisfy C. She became less animated and appeared more content. Apparently she desired only that I respond to her 'request' to play the tuba again as she abruptly lost interest and began to open the door to make her exit. C's interest had been held for nearly twenty-five minutes.

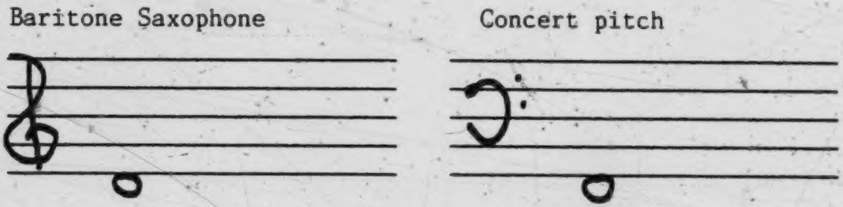
Alto Saxophone - Baritone Saxophone

C was not in school due to Spring break. Audition of the saxophones took place in C's home after making arrangements with her mother. The following field note excerpts record my music session with C, using the alto and baritone saxophones.

April 3, 1986 9:00 a.m.

I arrived at 9:00 a.m. and was met at the door by C's mother. C appeared from the kitchen area and stood by her mother's side watching as I removed my coat and put the instruments on the living room floor. C began to play on the floor next to the instruments which were still in their cases. C lay down between the two instruments and glanced in my direction several times as I spoke with her mother. C looked into my face each time and smiled once as she was looking at me. I asked her mother if she would take C to the kitchen, out of sight as I wanted to get the instruments out and begin playing one of them in the living room without C seeing me do this. I also wished to see if C would come to the living room upon hearing the sound, as locating sound in the environment is sometimes difficult for autistic children. I sat in a chair in the middle of the living room and began to play a sustained low D on the baritone saxophone.

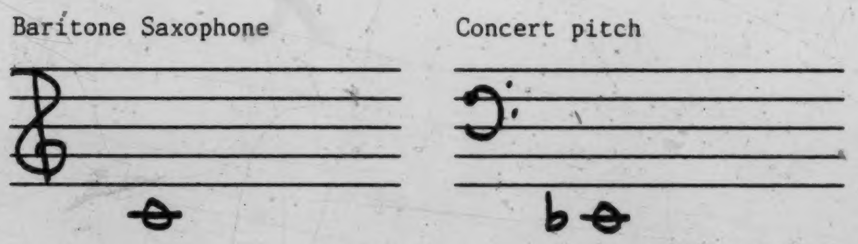
This pitch transposes to an F on the first space below the staff in bass clef,


Baritone Saxophone

Concert pitch

and is the concert pitch with which I begin all music sessions.

> C came running to the living room immediately and stood before me. She had a look of delight on her face and began to vocalize by making throaty sounds that nearly always occur when she is excited or happy. This single sustained note had grasped C's attention and elicited a curious response to the instrument. I then began to play a number of nursery rhymes that I knew were familiar to C. She seemed content to sit on the sofa and listen. The playing of "Happy Birthday" evoked a short, high pitched vocalization and a smile. C sat on the sofa for several minutes playing with her feet as I went through "Twinkle, Twinkle, Little Star," "Mary Had a Little Lamb," "Row, Row, Row Your Boat," "Rock-a-bye-Baby," "Brahm's Lullaby," "Sesame Street," and "Flintstones" theme. During the second rendition of "Twinkle, Twinkle, Little Star," I stopped playing very abruptly without completing the phrase. C grasped the bell of the saxophone and pulled it toward her body. While she was doing this, I began to play again, not the conclusion of the nursery rhyme, but a low C on the instrument.


Baritone Saxophone

Concert pitch

Because this note is at the lower register of the instrument with nearly all the keys closed, the tone generates a sound that seemingly rumbles the immediate acoustical environment and causes the instrument itself to resound with vibration.

C had cautiously responded to the sounds. The abrupt cessation of the music elicited a response from C indicating that she wanted the sounds to continue. By touching the instrument and pulling it toward her body, C was communicating with me. C had initiated this contact, and because she grasped the instrument near the end of the bell, I knew that this would be an opportune moment to enable her to experience tactile stimulation through the strong vibrations present during the sustaining of the low C (Eb concert).

> C then placed both hands on the instrument and seemed to enjoy a pleasant sensation of tactile stimulation. C placed her fingers on the keys and I moved them up and down while sustaining tones using my left hand fingerings only. C was studying the lower part of the instrument. I hope she was registering cause-and-effect relationships as she pushed the keys and manipulated them. Simultaneously C was experiencing auditory, tactile and visual stimuli as well as engaging in motor activity. I do not feel that she perceived any relationship between the sounds and the vibrations, or the movement of keys and the resultant change in pitches. C seems to make no spontaneous comparison between phenomena. C attended to the baritone saxophone for nearly two minutes before releasing it and leaning back in the chair. I continued to play and C very intentionally put her stockinged foot in the end of the bell, leaving it there only momentarily. Perhaps she was attempting to sense the vibrations on her foot. C then ran to her mother in the kitchen.

From the parental-interviews and subsequent conversations with C's mother, I knew that C rejects high-frequency sounds. This aversion to high pitched sounds has been born out in my musical sessions with C. There is a very definite preference for instruments in the lower range. C rejects and appears to fear the mix-master used by her mother, yet seems to have no aversion whatever to the vacuum cleaner, which has an equally or more intense sound, but is of lower frequency. I had asked C's mother earlier to plug in the mix-master so that I could both determine the pitch frequency of the motor sound and to observe C's response to it. C's reaction is recorded as follows.

> I followed C to the kitchen playing the baritone saxophone as I went. C stood by her mother's side with no apparent interest in the instrumental sound or myself. As soon as C's mother opened the drawer to take out the mix-master, C plugged her ears. There was no sound as her mother had not plugged in the machine as yet. When the machine was plugged in, C ran from the kitchen to her bedroom. The playing of "Happy Birthday" evoked a curious peek around the corner of her room. C was enticed back to the kitchen only after the mix master was unplugged and C's mother offered her a glass of juice. C then went back to her room and played on the floor midway between her room and the hallway. I had, in the meantime, taken the alto saxophone and I played an A in both octaves and very loud.

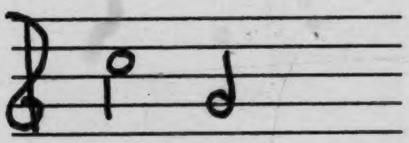
The A's I played on the alto saxophone transpose to the concert pitch of middle C and third space C in the treble clef. The higher C is the pitch frequency of the mix-master. I wished to see if C's hypersensitivity was due to the pitch (C concert) or to the tone quality of the mix-master. C's response is recorded as follows.

> C put her finger to one ear very briefly and then continued to play on the floor. I persisted in playing the A's in one octave after the other in loud fashion but elicited no other response. Perhaps C's aversion to the mix-master sound and the fact that C responded initially by putting her finger in her ear when I played A's on the alto saxophone is evidence of hypersensitivity to the pitch frequency of concert C. There was no evidence of this phenomenon during music sessions with the other instruments, however. C did reject the higher pitched, more intense sound of the clarinet, showed no interest whatever in the trumpet as compared to the tuba, and rejected the

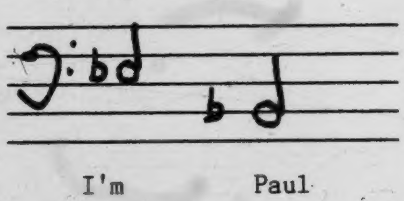
recorder completely, manifesting this rejection by putting her fingers in her ears when it was played.

The playing of the nursery rhymes, this time on the alto saxophone and thus sounding an octave higher albeit with the same basic saxophone timbre as the baritone saxophone, evoked no reaction or response. C was brought back to the living room by her mother. C had a tantrum until her mother gave her celery and an orange. I retrieved the baritone saxophone, played C's name theme, and then sang her name theme to her. C tilted her head to one side, studied my face very intently and then vocalized with several staccato bursts of sound, "ha-ha-ha." I repeated this sequence over and over again and C very clearly was perceiving what I wanted her to do - sing (say) back her name to me. C would respond to my playing and singing her name theme with throaty attempts (?) to respond in kind. There appeared to be rapt attention to me, to the instrumental sounds and to my words of encouragement to get her to try and verbalize. I changed to my name theme.

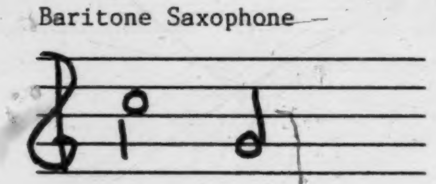
Baritone Saxophone

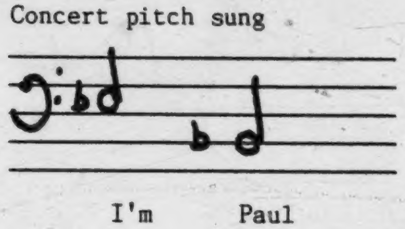


Concert pitch sung



With this, C's interest peaked and she moved her body, smiled with delight and vocalized "ha, ha." For several minutes she paid undivided attention to me as I played and sang her name theme and then mine. I perceived that C was attempting to respond on several occasions but just was unable to do so. Cognition was there, the function was not. After perceiving that C was tiring of this repetitious playing of the two name themes, I began to play nursery rhymes again. C ran to her room and engaged a toy that played music. Was C communicating that she too, could make music? From the toy, C went to a closet door behind a glass partition in the entryway. The door squeaked as she moved it. C was responding (musically?) to my musical sounds by creating sound of her own. C's creating of these sounds was not done randomly but seemed to be in direct echo to the sounds that I would play on the baritone saxophone. This responsorial effect was not consistent, however. C came back to the sofa and sat eating celery. I was talking to C's mother about her attempt to 'join the band,' to show me that she, too, could play music. The session had lasted nearly an hour and I was just about to put the instruments away when I thought I would play my name theme once again.





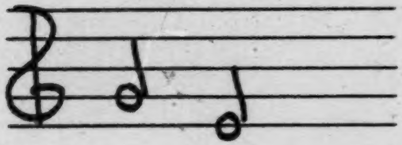
Immediately, in exact pitch, accurate rhythm, and with clear enunciation C sang, "I'm Plah." I stood there in disbelief. C's mother broke the silence with an elated "C, you are sure full of surprises." Further attempts to have C repeat this verbalization by echoing my name theme and her name theme were unsuccessful until several minutes later when I was ready to leave the house. C walked from her bedroom to the living room uttering what sounded like, "I'm Plah, I'm Plah, I'm Plah." This was her attempt to say "I'm Paul."

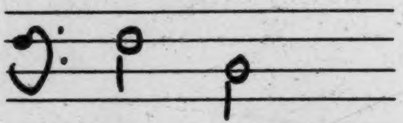
My personal reflections indicate that I left C's house elated that she would attend to the sound of the baritone saxophone for the better part of an hour, would respond by making her own 'music,' and would make such a convincing attempt at verbalization.

Clarinet - Bass Clarinet (repeat)

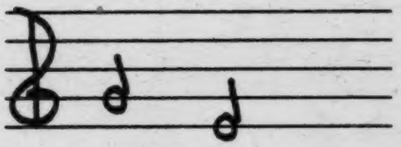
April 17, 1986 1:30 p.m.

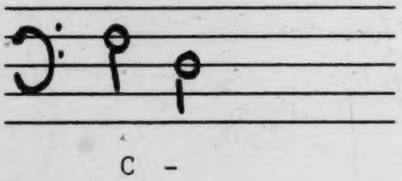
This music session took place in C's classroom, a large, brightly decorated room complete with desks, tables, toys, a book shelf, carpet and sink. There were six other children in the room. All were engaged in various other activities under the supervision and guidance of four teacher aides. I was hidden behind a screen with a one-way observation window. C was brought into the room by her teacher and, according to a pre-arranged plan, would begin her usual one-to-one activity with the teacher before I would begin playing. Approximately five minutes into C's one-to-one activity with the teacher, I began to play the bass clarinet. I began with C's name theme, a theme which she has heard repeatedly on eight different instruments.


Bass Clarinet


Concert pitch

C's response was immediate. She had been deeply absorbed in the sliding of colored objects up and down a network of metal frames. Upon hearing the sound, C looked up, tilted her head to one side and sat motionless as if straining to hear better. I repeated the playing of C's name theme. She did not move. Her attention was focused on the sound. C had lost all interest in the colored objects which, just seconds before had so completely held her attention. I played C's name theme again and then sang the theme.

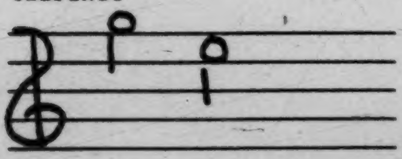

Bass Clarinet

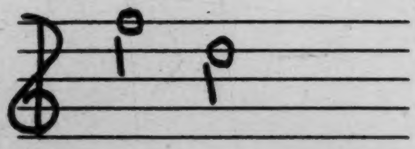


Concert pitch sung

C got up from the desk at which she had been playing and began moving about the room in animated fashion. As I continued to play C's name theme, she moved about the room, sometimes hopping on one foot, occasionally skipping to and fro with frequent darting and lunging in the direction of the bookshelf. C returned to her teacher a number of times, making eye contact and with some vocalizations. It appeared as though C was seeking an answer from the teacher as to the whereabouts of the origin of the sound. C continued her movement, occasionally touching objects in the room but ever so briefly. There was no indication that C had any awareness as to the location of the sound's origin. C's teacher thought the frequent eye contact to be most unusual and was perhaps an attempt on C's part to find out if it might be the teacher who was creating the musical sound.

I took the clarinet and played C's name theme two octaves higher than what I had just been playing on the bass clarinet.


Clarinet


Concert pitch

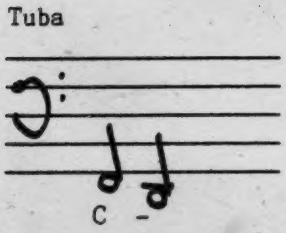
The difference in pitch range and timbre made no noticeable impact on C. She continued to walk about the room and centered her attention on the books on the bookshelf. Apparently, the sound of the clarinet did not appeal to C, for she seemed to lose interest. I again took the bass clarinet and began to play "Brahm's Lullaby," "Pop Goes the Weasel," and "Twinkle, Twinkle, Little Star." During the audition of these tunes the teacher directed C to the back of the screen where I was playing. C made eye contact with me very briefly and then studied the instrument. She reached out to touch it and, upon feeling the vibrations, ran her hand along the lower joint of the instrument and put it into the bell. As I continued to play, C put her nose on the bell and smelled it. C then put her mouth on the bell. She continued by feeling the keys, although there was no attempt to depress them or manipulate them in any way. I began to play scale passages very rapidly, exaggerating my finger movements as I did so in an attempt to stimulate C's awareness of cause-and-effect. C studied my finger movements only momentarily. Again, I took the clarinet and this time played loudly in the high range. Having observed C's response to high-pitched sounds to which she is apparently hypersensitive, I expected to evoke a noticeable reaction. There was none. I took the bass clarinet once again and began to play *ad libitum.* C sat very attentively on the floor beside me. I played "Happy Birthday," wondering if there would be similar response to it, as there was the first time I played it for her on the bass clarinet. There was no noticeable response. C sat attentively through the audition of "Happy Birthday" and then began again to walk about the room, eventually making her way to the sink and signed to the teacher her desire for a drink. The session had lasted thirty-five minutes. As I left the classroom I waved good-bye to C three times. On the third time she responded by also waving good-bye.

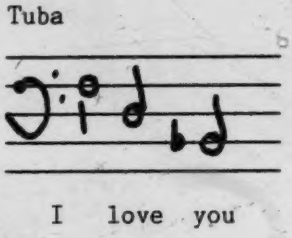
Trumpet - Tuba (repeat)

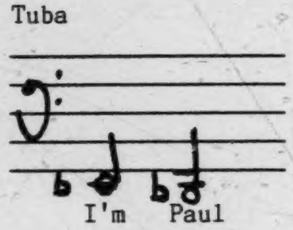
April 23, 1986 11:00 a.m.

C was very moody throughout the duration of this short ten minute session. For reasons unknown to her mother, C had been disturbed and upset all morning. The musical sounds from the trumpet did not appear to have any appeasing effect on C. However, she did become calm and attentive as I played the tuba. C listened as she stood before where I was sitting. As I tipped the tuba toward her, she ran her fingers along the circumference of the bell and put her hand deep inside. I moved the valves up and down to attract her attention. She reached out, pushed them herself and then sat down on a chair across from me. With very deliberate and careful movement, C put her foot on the first valve. When her foot was exactly in place, C depressed the valve with her foot. I was surprised at the dexterity C exhibited with this rather refined control and movement of her foot. Given the bad mood C presented upon coming into the music session, I was pleased to see that she took great care in not pushing the valve until her foot was exactly in place.

I played and sang C's name theme, the 'I Love You' theme, and my name theme several times each.







C made numerous vocal sounds in what I perceived to be an attempt to respond. C became increasingly frustrated. I terminated the session at this point.

Descriptive Data Relative to J

My meetings with J were happy occasions for her. J would nearly always recognize me very quickly. Upon my entrance into the room, J would come to me with excited animation and vocalization. I was particularly anxious to observe J's response to me on the first day of our musical sessions together. Excerpts from my field notes describe our meeting and subsequent music session together.

February 26, 1986 9:00 a.m.

> There was momentary hesitation when I appeared in J's classroom, but when she recognized me, J immediately walked to me, her body alive with excitement. There was recognition in her eyes as she looked happily into my face. J was smiling broadly and making loud vocalizations which expressed her state of excitement at seeing me again. I held J's hands down to show that I disapproved of the animated arm movement and hand-flapping which she engages in so frequently. At the same time I talked to her lovingly and reassuringly to show that I approved of her excitement and her joy at seeing me, but explaining that hand-flapping was not an acceptable way of showing that excitement. The hand-flapping ceased but it was obvious that the excitement remained.
>
> I extended my hand to J and asked for hers, taking it gently but firmly. She did not resist. We had a happy walk to the room where our music session was to take place. There were occasional bursts of staccato-like laughter accompanied by animated hand - flapping on our walk to the music session room.

Clarinet - Bass Clarinet

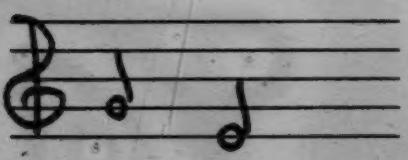
> J stood aimlessly in the room as if not knowing what to do. I observed her for a short time to see if anything in the room would attract her attention, hoping that she would become actively involved in something. I wanted to see if the sound of the clarinet would cause a cessation of that activity. J stood with a blank expression on her face, looking somewhat puzzled, not knowing what to do. Upon hearing the clarinet, J's head tilted to one side as if

trying to hear the sound more clearly. J has a hearing loss and perhaps the tilting of her head was to better enable her to locate the direction of the sound. J then responded with her head up toward the ceiling, eyes half-closed and somewhat dazed. J does this frequently when she tunes out. However, I don't think J was tuning out but was concentrating and listening intently to the sound of the clarinet. As a child J had corrective surgery for congenital ptosis. Because this problem lingers it is difficult to tell to what extent J may be staring blankly with half-closed eyes, or how much of this glazed-eye formation is due to her drooping eyelid problem. I did perceive that J was listening intently, and with undivided attention, for she attended the sounds of the clarinet without being distracted or showing interest in anything else in the room. Punctuated bursts of laughter accompanied by animated body movements and hand-flapping were interspersed with non-sensical vocalizations. These reactions were indicative of J's excitement at hearing the clarinet. At one point, J appeared to be coordinating her body movements, including hand-flapping, with the tempo of the music. The more rapidly I'd play, the more animated J's actions became. I did not wish to encourage her to self-stimulate in this manner, especially when both teachers and parents are tying to extenuate this stereotypic behavior. Nevertheless, I continued to allow J to respond to the tempo changes I was making on the clarinet and I observed her, meeting the increased intensity and speed of the notes with imitative bodily animation. J was displaying a form of non-verbal communication.

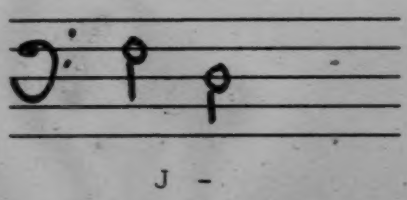
There was no observable modification in J's activity when I began playing the bass clarinet. J responded to the bass clarinet as she did with the clarinet; isolated bursts of laughter, self-stimulation, and vocalizations. I played quick rhythmic songs, such as "Mexican Hat Dance," "Pop Goes the Weasel" and "Irish Washerwoman." These songs were met with much animation and vocalization. The playing of the "Bach Chorale" elicited a gradual modification of the animated behavior and seemed to have a soothing effect on J. Midway through the chorale J's 'head up' response returned. Her head was cocked to one side with face toward the ceiling and eyes glazed and half shut. J remained locked into this position and frame of mood for the remainder of the chorale (total playing time approximately sixty seconds).

The playing and singing of J's name theme

Bass Clarinet

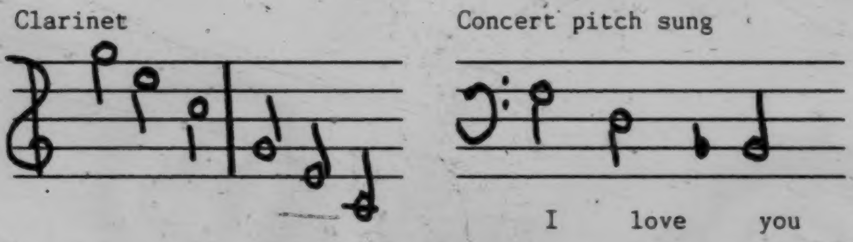


Concert pitch sung



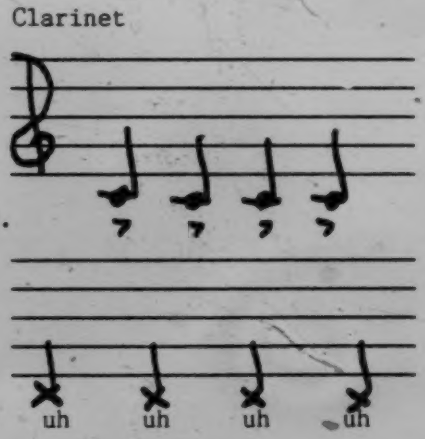
broke J's mysterious far-away look. A wide smile appeared on J's face accompanied by hand-flapping. At one point, after much repetition of J's name theme, first played and then sung, always in that order, J brought her hand to her chest with all her fingers pointing inward toward her body, thus indicating herself, and looking very, very pleased. This response indicated to me that the sounding of J's name theme was being met with a level of comprehension, not only at the cognitive level but within the affective domain as well. J was very obviously proud of the way she had responded.

The "I Love You" theme



evoked an outburst of vocalizations, detached bursts of laughter, hand-flapping and a wide smile.

I repeated low C's on the clarinet in rhythmic imitation of J's bedtime vocalizations which I heard her emit while at her home. These notes induced excitement and what I perceived to be J's only attempt at vocal imitation of any of the sounds I played for her on either bass clarinet or clarinet. I played



and J responded.

This echo response was repeated with responsorial effect two times. After the second response, the vocalizations gave way to excited self-stimulation in the form of hand-flapping. The faster and louder I played the four low C's, the greater the amount of animation and excitement. The "Bach Chorale" played in the Chalumeau (low) register of the clarinet had a calming effect on J. She became very tranquil, and with typical 'head back' posturing, attended the chorale, eyes glazed and half shut. When I finished playing, J's 'spell' was broken and she focused her attention on me, staring blankly into my face.

The entire session lasted thirty minutes. J attended without losing interest in what I was doing. She rejected every attempt I made to allow her to touch the instruments. When extending the instrument toward her, J would slowly but very firmly push it away. I did not persist. I was encouraged by J's rapt attention for the duration of the music session.

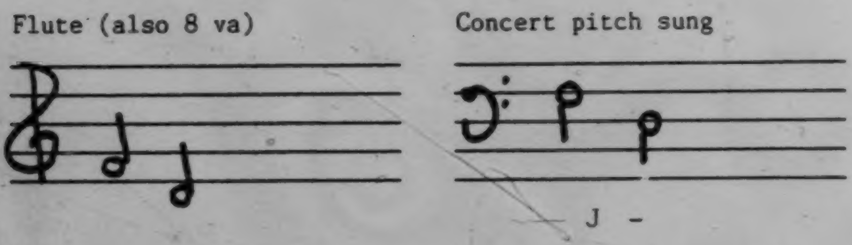
Recorder - Flute

March 19, 1986 9:00 a.m.

J recognized me immediately as I walked into the classroom where she was involved in a playtime activity at the table with other children. J got up from her chair and approached me in much the same manner as she has previously; with much bodily animation, occilating of the hands, guttural vocalizations, a wide smile and genuine enthusiasm. "Are you going to hear some music?" J's teacher asked. J responded with one high pitched vocal sound which approximated the word "Yah." J walked rapidly beside me as we went to the music room. J's brisk (for her) walk to the music session was indicative to me of her anxiousness to experience another music session.

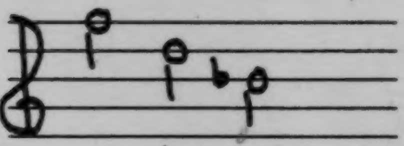
J sat very attentively as I began to play a sustained, low F on the flute. I continued to play *ad libitum*. J cocked her head to the left and tilted it back in her typical 'head up' position. With her body frozen in this position, she gazed upward with eyes somewhat closed. J's congenital ptosis makes it difficult to determine whether she is tuning me out or whether her eyelids are merely drooping. I sensed that she was attending to the sound.

Many repetitions of J's name theme

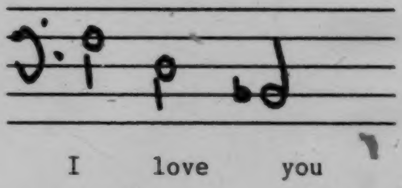


elicited bursts of laughter, not consistently, but upon several occasions. The 'I Love You' theme

Flute



Concert pitch sung



evoked detached bursts of laughter as well. I repeatedly played and sang J's name theme because of the absolute attention she was giving me. Suddenly, J emitted a soft guttural vocalization, an imitation, rhythmically, of the two note name theme I had been playing repeatedly. Rhythmically J's response was accurate but the pitch was not. Whether this imitation was volitional or spontaneous, I do not know. Several other attempts to elicit a comparable response were unsuccessful.

J responded to the recorder with hand-flapping. I played ad libitum, nursery rhymes and very quick tempoed tunes ("Irish Washerwoman," "Pop Goes the Weasel") to see if she would respond to the fast tempos with bodily movement. She did not. Although J was responsive to the recorder, at one point, while playing in the high range, I sensed that she was rejecting the sound. She squinted her eyes and gazed at the overhead light. This was the first time she appeared to be shutting me out. I ceased playing and J discontinued her frozen gaze. While her attention was on me I took the flute again and began playing rapid scale passages, holding the flute directly in front of her face. I greatly exaggerated the movements of my fingers on the keys so as to allow J to simultaneously sense both auditory and visual stimuli. There were more short outbursts of laughter, hand-flapping and a direct gaze at my fingers as they manipulated the keys. J gave her full attention to the movement of the keys even as I stopped playing but popped the keys down quickly and forcefully, thus creating a thud-like pitch change with each finger movement. J's attention was directed on the flute keys for nearly three minutes.

The playing of J's name theme was apparently met with recognition. Upon hearing it, she began hand-flapping, and emitting high pitched vocalizations, accompanied by isolated bursts of laughter. J's animated body movements waned as I began to play the "Bach Chorale." She sat serenely through the playing of it, no vocalizations, no self-stimulation, just listening.

This session lasted thirty minutes. Except for a few seconds where J's attention seemed to be elsewhere, J's full and undivided attention was apparently on what I was doing.

Trumpet - Tuba

March 26, 1986 9:00 a.m.

J happily accompanied me to the small observation room where I had previously put the trumpet in open case on a small table and placed the tuba on the floor. J looked momentarily at each instrument but made no attempt to touch them or to study them further. I sat in a chair directly in front of J and picked up the tuba. Because the instrument is large and shiny I thought that J might show some interest in the instrument. She did not. J got up from her chair and attempted to open the door to leave. I gently led her back to her chair and asked her to sit down, helping her to do so as I spoke. J sat down but immediately reached for the door handle and began to move it up and down. J also discovered the rotating light switch and turned it until the room was dim except for the natural light coming from the windows. She did glance upward toward the light for approximately three seconds. I did not sense that J was registering a cause-and-effect relationship for she made no furher attempt to touch the switch.

J was agitated and nervous during the first several minutes in the observation room. The room itself is quite small with room only for a table, two chairs, the instruments and not much more. The room has a bright light as well as natural light from both the window in the door and the large rectangular observational window. An attempt to calm J by calling attention to her own reflection in the tuba was not successful. Perhaps the closed-in feeling in such a small room caused or contributed to J's nervous, fidgety behavior. J was equally as unresponsive when I attempted to give her tactile stimulation by taking her hand and caressing the smooth, cool surface of the tuba bell. The attempt to use visual and then tactile stimuli to calm J were both unsuccessful. It was the auditory stimulus resulting from the tuba sound which brought an immediate modification in J's behavior. Excerpts from my field notes record the effect of the tuba sound on J's behavior.

> As [illegible] sat fidgeting in her chair I began to play a sustained F
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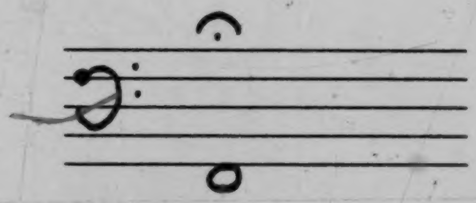
> 
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> at a very soft level of intensity. J's behavior change was immediate and abrupt. J ceased all activity and body movement, tilted her head to one side as if trying to perceive the direction of the sound and seemed to focus her attention on my face. I increased the volume to a loud intensity and J assumed her 'head back' position with eyes glazed. I decreased the volume and made a natural transition from the sustained F to J's name theme.
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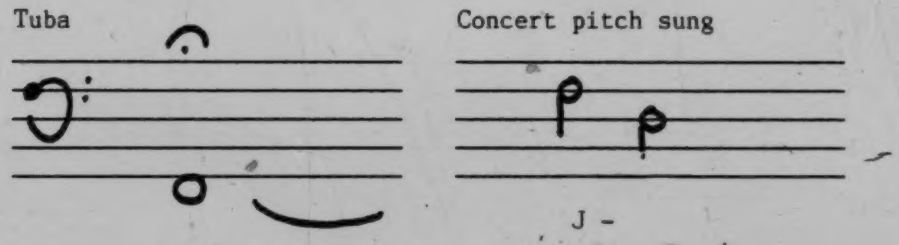
> 
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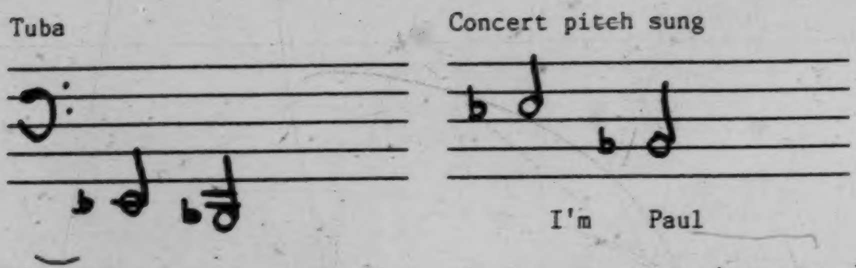
>
> J reacted to her name theme with apparent recognition. She appeared delighted and began to emit vocal sounds accompanied with hand flapping. An attempt to have J imitate her name theme by repeatedly playing and singing it over and over to her was not successful. J did attend well to this for two or three minutes and then lost interest and began looking out the window in the door. J had been distracted by an aide and several other students who had momentarily stopped in the hallway just outside the music session room. J's attention was focused on me once again when I began playing the tuba. I played and sang.



> After playing and then singing my name theme to J several times, each time placing my hand palm downward on my chest as I sang "I'm Paul," thus indicating that I was speaking (singing) of myself, J very clearly pointed to herself, all her fingers pointed inward toward her chest. Guttural vocalizations followed, interspersed with bursts of punctuated laughter. J was obviously pleased with herself.

Pronominal reversal (I-You reversal e.g., "You want a cookie" meaning "I want a cookie") is a characteristic abnormality in many autistic children. J's pointing to herself at the playing of my name theme could have been a variation of this reversal phenomenon, translated through and responsive to musical-sound stimuli. Was this a genuine inability to comprehend or to attach meaning to the concept of self, or was it simply an imitative repetition of what J had seen me do?

J's reversal response in this case is not consistent with her response to the playing of her name theme on the bass clarinet. During the musical session with J on the bass clarinet, J responded to her name theme by pointing to herself, all fingers pointed inward in the direction of her chest.

> The sound of the trumpet elicited a startle response when I played at a high intensity level. There was also bodily movement, hand-flapping and glazed-eye response. At first, J rejected the trumpet when I put the bell on her knee and played sustained tones in the lower range. This was done to enable her to sense the vibrations as well as hear the musical tone. J pushed the trumpet away but I gently persisted in placing the bell on her knee and playing softly. Slowly J's tactile defensivity decreased and was transformed into an invitation for more of the stimulus. I

played several sustained tones and "Twinkle, Twinkle, Little Star" with bell cupped over J's knee. Upon cessation of playing and simultaneously removing the trumpet from J's knee, she began to move her hands back and forth, not stereotypic hand-flapping fashion but in a manner which was indicative to me that she wanted to sense the trumpet sound-vibration again. I began playing again. J sat with her attention focused on me. I played "Twinkle, Twinkle, Little Star" again and cupped the bell over J's knee as I played. At the completion of the nursery rhyme I removed the trumpet from J's knee. J reached for the trumpet and pulled it toward her body. I placed the bell on J's stomach and began playing the tune again. J tilted her head to one side and remained statue-like, frozen in this position for the duration of the song. My leg became cramped as I tried to maintain my squatting position, keep the bell firmly placed on J's stomach and continue playing at the same time. I had to withdraw the trumpet abruptly in order to catch my balance and relax my leg. J pushed the trumpet toward her body and again assumed her trance-like expression as I began to play. Each time that I ceased playing and withdrew the trumpet from J's knee or stomach, she would push the instrument toward her body, indicating that she wished to sense the sound-vibration again. Interestingly, J did not look at the trumpet as she pushed it but maintained a steady stare into my face as she was attempting to move the instrument toward her body. J never grasped the trumpet to pull it toward her but always drew it to herself in a pushing motion with open hand. When I placed the instrument back on her stomach or knee and began playing, J always reacted with a 'head-up' response, eyes glazed and apparently listening intently. Simultaneously, J's hands and fingers were feeling the bell of the trumpet which was pressed on her body. It was this part of the instrument from which she sensed the vibrations. J's searching finger and hand movements across the bell of the instrument were similar to those a blind child might make in an attempt to sense an object.

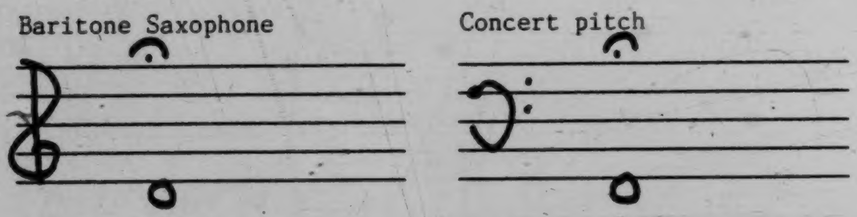
There was a startle-response to both the tuba and the trumpet when played at high intensity levels. The session lasted thirty-five minutes.

Alto Saxophone - Baritone Saxophone

April 11, 1986 9:00 a.m.

J was sitting at a round table with a teacher aide and other students in her class. Upon entering the room, J recognized me and immediately got up from the table and came over to me, offering me the 'jack-in-the-box' she had been playing with. I took the toy and turned the handle until 'jack' popped up. J was self-stimulating by hand-flapping. This was accompanied by broad smiles and detached bursts of laughter. Our walk to the music session saw J happy and excited. J walked quickly with me and appeared to be in a state of expectancy and anticipation. I attempted to stimulate what I thought was anticipation to hear music by asking her if she wished to hear some music played on the saxophones. J responded vocally with guttural sounds and a broad smile.

The music session took place in the observation room, a room with only two chairs, a table in the corner, and room for little else other than the instruments, J and myself. The alto saxophone was in open case underneath the table. The baritone saxophone I held in playing position as I sat in a chair directly in front of J. J made no attempt to touch the instrument. She did sit attentively with expectant look on her face as she gazed directly into my face. I began by playing a soft low D on the instrument.



J, who had been sitting attentively, began to hand-flap, make guttural noises, smile and move her body around in the chair. The sound obviously triggered a happy response as J attended the baritone saxophone sounds for nearly four minutes. I went from the sustained low D to ad libitum playing in order to match J's level of bodily response. I stopped playing each time J began to hand-flap and gently put her hands on her lap, telling her not to do that. J always ceased this compulsive behavior as a result of my placing her hands down and telling her to cease. However, as her excitement would grow, apparently stimulated by the sounds of the baritone saxophone which were played to match the rhythm and intensity of her bodily movements, J's excitement would seem to peak, the end result being an outburst of hand-flapping.

After one such outburst, J ceased her self-stimulating behavior and turned her attention from the instrument to the rotating light switch on the wall. J turned the switch until the light was off and looked upwards toward the light. Whether or not J realized that she had effectuated this change was not apparent. J did not rotate the switch to turn the light back on. Momentarily she played with the door handle and attempted to open the door, getting up from the chair as she did so. I asked J to sit down and gently

> but firmly returned her to her chair. She complied but again began to play with the light switch. I played J's name theme
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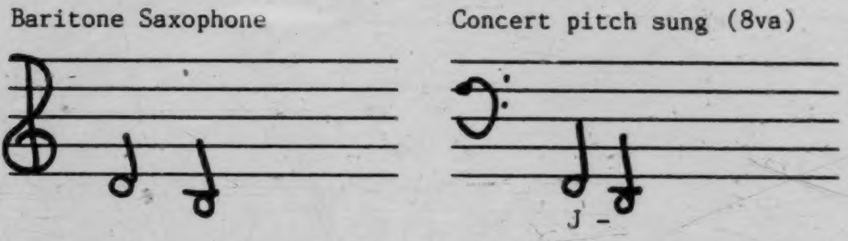
> 
> Baritone Saxophone
> Concert pitch sung (8va)
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>
> and then sang it. There appeared to be immediate recognition as the playing and singing of this two-note theme brought about a sudden alteration of activity. J ceased playing with the light switch and focused her attention not on the instrument, but on me (my face). J's facial expression changed from one of intense concentration directed at the light switch to a happy smile (recognition of her name theme?) and a contemplative gaze face to face with me.

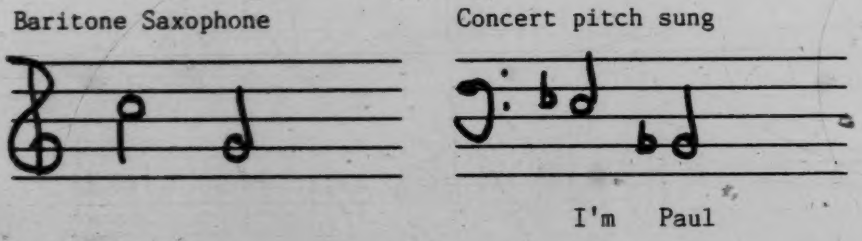
Many autistic children show a fascination with gadgets, light switches and the like, and will play with them for hours on end. To have produced a sound stimulus which enticed J away from gadget-playing and toward the sound itself verifies hypotheses about one's individual ISO sound principle and the possibility of using an instrument that produces that sound as an intermediary object which can open up channels of communication. To have J alter her activity and suddenly focus her attention in the direction of the sound, indicates that perhaps the sound of the baritone saxophone is in some way empathetic to her individual ISO sound.

J's sudden alteration of activity, which revealed a preference for sound over gadget-playing, also revealed a greater potential for affective contact with her. J's attention was focused directly at me and not at the instrument. Her expectant gaze into my face indicated that she was expecting something not from the baritone saxophone, but from me.

One of the diagnostic features of autism is a preference of objects over people. Kanner (pp. 217-250, 1943) used the 'pin prick' test with children suspected of being autistic to see if they would respond more to objects than to people. Kanner noted that normal children, when pricked with a pin, would react to the person responsible for the pin prick; the autistic child typically ignores the person and responds to the pin.

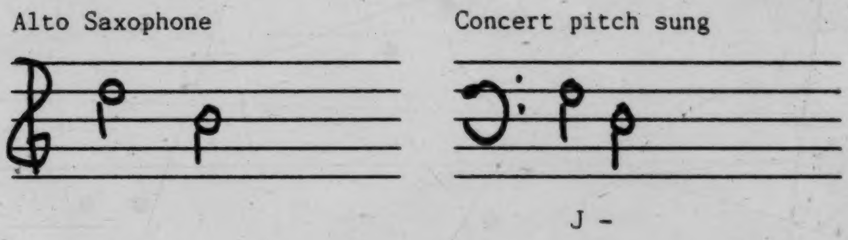
To have seen J's anticipatory expression directed towards me rather than at the instrument was encouraging in that such a response reflects the ultimate objective of this study, namely, an opening up of communicative contact with children involved. The music is only a means to that end.

The playing followed by the singing of my name theme



elicited more smiles and a pointing to herself instead of me. J responded with this reversal of identification a week ago as I played my name theme on the tuba. Perhaps this is a variation of the pronominal reversal phenomenon found frequently in autism. Subsequent attempts to get J to respond in kind were unsuccessful.

J began to rattle the door handle which was within easy reach of where she was sitting. While her attention was on the door handle, I put down the baritone saxophone and began playing the alto saxophone. J's attention was once again turned from playing with an object to the focusing of her attention on a sound. J's 'head up' response indicated to me that there was a perceptual awareness of timbre change, as well as an auditory discrimination of pitch change and/or change of compass. I played and then sang J's name theme.



This was met with a gleeful smile. I repeated the sequence over and over again to J's obvious amusement. When I abruptly stopped playing J studied my face intently. I did not continue to play nor did I move. J's strong desire to have the sound resume got the best of her as she reached out, grasped the bell of the instrument, pulled it towards her, and maintained her grasp on it. I began playing again and J released her grip but left her fingers lightly touching the edge of the bell. It appeared as though J was deriving pleasurable tactile sensation from the vibrations felt through the bell of the instrument. As I continued to play, J's 'head up' posture returned, her eyes half shut, her fingers searching out sensory stimulation from the vibrations on the bell. For ten minutes I played several times through "Rock-a-bye-Baby," "Brahm's Lullaby," and a Bach Chorale ("O Sacred Head Now Wounded"). J sat attentively, listening quietly as I played. Her fingers searched the circumference of the bell, and her head was tilted back. I had J's undivided attention. Occasionally J would put her fingers and hands on other parts of the instrument but would invariably return to feeling the bell where the greatest amount of vibration could be felt. After ten minutes I ceased playing from fatigue, as I had been balancing on one knee so as to accommodate J by allowing the instrument to be close to her, almost on her lap. Upon the abrupt cessation of playing, J tugged on the neckstrap which supports the weight of the saxophone from the back of my neck. Again, J was communicating her desire to have the saxophone sounds continue. Over and over again I played the songs which I had played earlier. J sat quietly, attentively, occasionally looking directly into my face as I played and then resuming her 'head up' posture with eyes half closed. J's finger movement on the bell of the instrument was very graceful, refined and gentle without any hint of harshness or roughness.

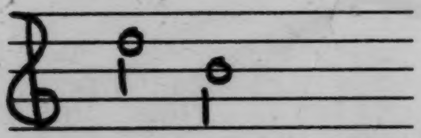
Heretofore, J had resisted any attempt whatever to get her to touch the instruments. The only exception was the trumpet which she pushed toward her body in an open handed sweeping motion. In this case J grasped the bell of the alto saxophone fully and pulled it toward her, releasing her full-handed grasp only upon hearing the sounds and sensing the vibrations. J's fingers remained on the bell as long as I continued to play. Any interruption of the playing saw J make some effort to have the instrument sound again either by grasping the bell or pulling on the strap. While doing this, J was engaging my face with her eyes. The focal point of her attention was not the instrument but me. I sensed that there might be an awareness of cause-and-effect relationship, that perhaps J realized that I was the one responsible for generating the sound-vibrations which she desired to hear. This session lasted thirty-five minutes.

Alto Saxophone (repeat)

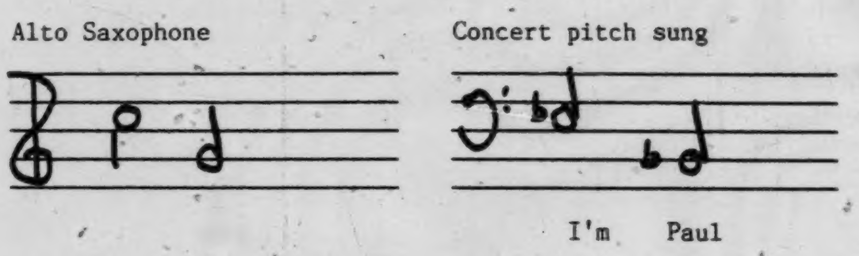
May 7, 1986 10:00 a.m.

~~J was taken~~ to the washroom so as ~~not to see me~~ as I entered the classroom with the instruments. I took my place behind the screen and observed J and the six other children in the classroom through the one-way observation window. J was brought in and seated at a table by the teacher. I played but did not sing J's name theme.

Alto Saxophone



J's response was immediate. She assumed her 'head up' posture. She was not light gazing nor was she using this 'head up' response as an avoidance tactic as she often does. In an effort to locate the sound, J seemed to be searching the ceiling by looking to and fro. J then began looking around the room, up at the ceiling and in the teacher's direction as if expecting an answer from the teacher as to the whereabouts of the origin of the sound. I played through "Happy Birthday," "Row, Row, Row Your Boat," "Brahm's Lullaby," "Pop Goes the Weasel, as well as some ad libitum playing. J sat attentively at her chair throughout the entire audition of these songs. She looked intently around the room as if wondering where the sound was coming from but made no attempt to get up and search out the sound. Other children's noisy reaction to the music contributed to a rather cacaphonous environment. J, nevertheless, seemed oblivious to these other noises. She seemed intent on listening only to the alto saxophone. At this point I played and sang my name theme.



J pointed to herself and repeated this response three times. I stepped out from behind the screen and began to play extemporaneously. J continued to search the room and inadvertently discovered me in the process. J's excitement peaked as she began to emit guttural sounds, and engaged in agitated hand-flapping movement. I continued to play and J stood attentively before me with a smile on her face. I placed J's hands on the bell of the saxophone and she left them there as I played. J lightly caressed the bell of the instrument with her fingers, apparently deriving sensory satisfaction from the sound vibrations. I sensed that, in some small way, J was cognizant of the instrument as a generator of both the sounds and the vibrations which she was experiencing. By this time, other children in the classroom had gathered around the saxophone and were depressing the keys, feeling the bell and putting their hands into the bell opening. I began to play for the other children. As I did so, J pushed her way through the others, making her way toward me. She grasped the saxophone firmly in full-handed grasp, and began pulling the instrument towards the door with me in tow. J was very obviously communicating her displeasure with my sharing the music with others (jealousy?). With smiles, gleeful laughter and obvious excitement, J continued to pull the saxophone toward the door. J wanted to go to the room where we had had our previous music session. We left the classroom and walked to the music session room. J attended quietly with a continuous smile on her face. I repeated my name theme and J pointed to herself. I sang, "I'm Paul" and asked J if she could say "I'm Paul." "Come on J," I said, "say, I'm Paul." J very clearly said "I'm." She did not say Paul. J did not repeat this. We went back to the classroom and I waved good-bye to J as I left. On my way down the hallway I heard the door open behind me. J had begun to follow me. The teacher came out and retrieved J, saying to me, "J sure likes you and wants to be with you." I played another tune for J before she was taken back to her classroom. This session lasted forty-five minutes.

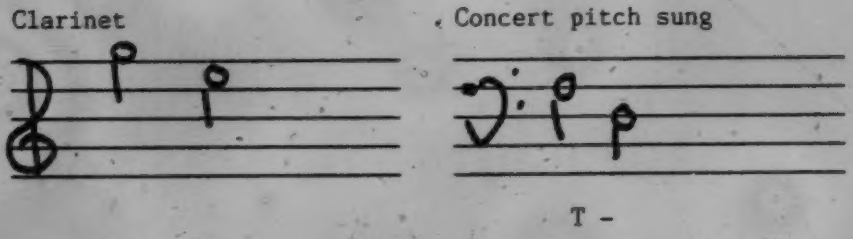
Descriptive Data Relative to T

Clarinet - Bass Clarinet

February 26, 1986   10:00 a.m.

I met T in her classroom where she was walking aimlessly about, clutching a rag doll. I greeted her warmly and put her on my lap as I sat on one of the small children's chairs. T molded to me and seemed content to sit on my lap and cuddle.

We began our walk to the music session. T walked beside me but turned around several times as if she was disoriented. Finally, I picked her up and carried her to the music-session room. The room had two desks, a sofa, two chairs, a large window and several plants. I sat T in a chair and then sat down in a chair directly in front of her. T sat quietly but with slight head and body movement. As I began playing the clarinet, T's head movement began to increase. There was much grimacing and clicking of teeth as I continued to play. There was an occasional smile accompanied by one high-pitched vocalization. The smile was difficult to differentiate amongst all the grimacing. There was, however, a more relaxed expression on T's face when she smiled. Cheeks and lips were not as tightly drawn with the smile. Grimaces were not accompanied by the high-pitched vocalizations, whereas the smile was. I perceived that T's increase in body movement, the grimaces, the smiles and the vocalization were indications that T was enjoying the sound of the clarinet. I repeatedly played T's name theme followed by the singing of it.



There was no response other than the active body and head movement and clicking of teeth.

I placed the bell of the clarinet on T's leg and began to play in the extreme low range of the instrument so as to generate noticeable vibrations. T rejected this attempt to enable her to simultaneously sense sound and vibration. T withdrew her leg. I continued playing but with the instrument away from T's body. During the course of the

> playing, I put the bell of the clarinet gently on T's stomach, sustaining a low E.
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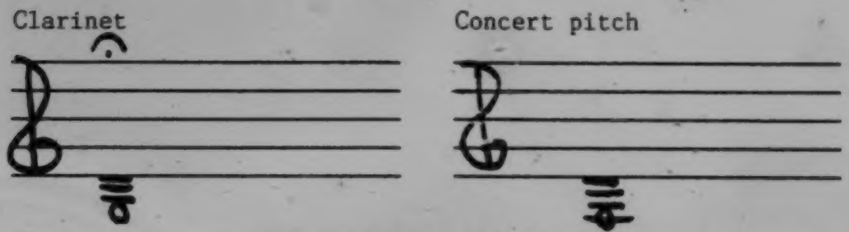
> 
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>
> As I did so, T registered only slight rejection.

The low E is the lowest pitch on the clarinet. In order to play this tone, all the keys must be closed. The result is that the vibratory center is then focused on the bell of the clarinet, thus enabling the greatest possibility to tactually sense vibrations from this part of the instrument.

During the course of the participant-observation phase of this study, I observed T's response to the vibrator machine which was applied to her leg by the teacher. T was obviously pleased with the sound of the vibrator machine because she began to smile as soon as it was turned on. T resisted the machine as it was touched to her leg. This was only an initial response, however. Because of the teacher's gentle insistence, T was able to sense and enjoy both the sound and the sensory pleasure derived from the vibrations of the machine. The sound-vibrations generated on the clarinet could serve to reinforce T's awareness of sound and vibration and could awaken in her a perception of cause-and-effect.

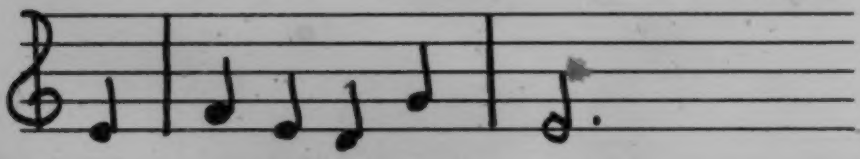
> I persisted by holding the clarinet on T's stomach. She allowed the instrument to remain there. I encouraged T to touch the instrument by asking her to do so. At the same time, I gently but firmly took T's hand and placed it on the instrument. There was one small attempt to touch the

instrument at my coaxing but T quickly withdrew her hand. I was satisfied at this point to have had T reach out on her own to touch the clarinet.

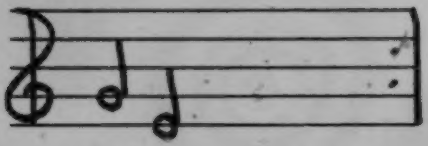
T sat quietly in the chair as I got the bass clarinet. The cessation of playing did not bring about an immediate change in behavior. T did wind down slowly and became more tranquil with much less head and body movement as I played the bass clarinet.

The playing of the bass clarinet seemed to have a tranquilizing effect on T. T sat very attentively as I played her name theme repeatedly. T's eyes were clearer and more focused as I played the bass clarinet. A slight smile, perhaps one of recognition, appeared on T's face as I played "Mary Had a Little Lamb," a tune which she hears frequently at home on her musical doll. Self-stimulating behavior ceased entirely as I continued to play the bass clarinet slowly and softly. I made a smooth transition from the final two notes of the Bach Chorale ("O Sacred Head Now Wounded") to T's name theme repeated over and over.

Final phrase of Bach Chorale - Bass Clarinet



T's name theme



T -

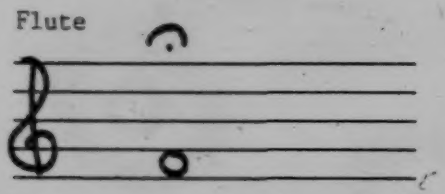
T became very restless and attempted to get down. I helped T from her chair. She walked to the door, stood for a moment and, as I continued to play, returned near to me, standing attentively. There seemed to be no perceptual awareness of the origin of the sound although T was obviously drawn back to me by the playing of the bass clarinet. There was absolutely no evidence that T was aware of cause-and-effect i.e., that it was the instrument producing the sounds; or that the instrument was controlled by me.

The session lasted twenty minutes. I carried T back to her classroom as she appeared to be disoriented in the hallway. T snuggled closely to my body as I carried her. She made cooing sounds as we went. Perhaps T's cooing sounds were her way of contributing to and/or continuing the music session.

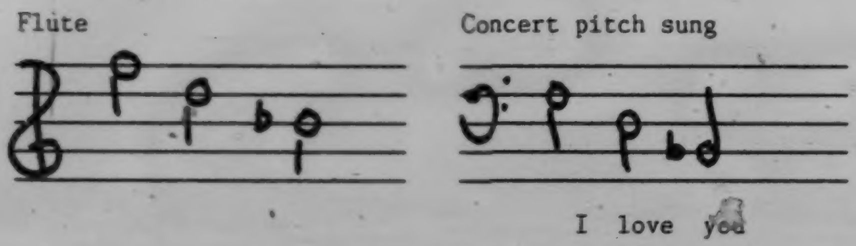
Recorder - Flute

March 19, 1986 10:00 a.m.

T walked with me to the music session which took place in the same room as the previous session. T sat quietly on her chair as I took a seat directly in front of her and began playing the flute. A sustained F



brought about no overt reaction from T other than increased bodily animation. T was very obviously aware of the new sound permeating her environment. T's head would tilt to one side, she would emit short punctuated sounds of high pitch, and would rotate her torso in rocking motion. The playing of "Rock-a-Bye-Baby," continuing with "Brahm's Lullaby" seemed to have a soothing effect on T, resulting in decreased bodily movement but accompanied by sudden vocal outbursts of happy excitement. Both of these songs are familiar to T as they are both heard at home on T's musical doll. Occasional facial grimaces occurred but seemed to have no relationship to the music played, for they presented themselves with or without musical background. There was also some clicking of teeth accompanied by pursing of the lips during audition of the flute. The playing and singing of the 'I Love You' theme



elicited what I thought to be a smile but may have been only a grimace. Increased body animation accompanied by tilting of the head occurred when I ceased playing the flute. This increased bodily movement and activity was indicative to me

> that T wished to hear the flute sounds again. I purposely delayed playing the flute for two minutes so as to be able to watch T's reaction. The longer I sat in silence before T, the more agitated she became. As I began to play again, T gradually became more tranquil until she sat quietly before me, her only movement being a slight but peaceful rocking motion. Again, "Rock-a-Bye-Baby" and "Brahm's Lullaby" had a quieting effect on T.

From the parental-interview in T's home, I had learned of her fascination with a musical doll. The doll plays several nursery rhymes upon pushing a button on its stomach. I had also observed T with this doll and knew that rendition of these tunes is an all important factor in calming T at bedtime. Although she cannot activate the music herself, T's parents have activated the doll and have noticed that the musical sounds have a tranquilizing effect on T, greatly reducing fidgety or nervous behavior.

I attempted to imitate two of these tunes, the two tunes whose melodic and rhythmic properties, I thought, would be most conducive to inducing a peacefulness and tranquility in T. Each time I played these tunes, ("Rock-a-bye-Baby, Brahm's Lullaby") whether on flute or recorder, T would become less restless and more attentive.

Even though T is non-verbal and thus incapable of demonstrating verbal memory through speech, her consistent calming reaction each time these tunes were played is indicative of a memory relationship between these tunes sounding from her doll in bed at night and sounding now from the instruments I play for her.

T sat rocking as I played "Rock-a-bye-Baby" and "Brahm's Lullaby." I gradually increased tempo and rhythmic activity by playing "Mexican Hat Dance" and "Irish Washerwoman." This was an attempt to see if T would respond by coordinating the speed of her rocking motions with the speed of the music. She did not. T's rocking remained slow and rhythmically steady in spite of the fact that the increased musical tempo was inviting a much faster rocking pace.

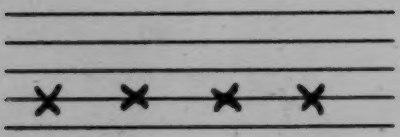
With the exception of "Rock-a-bye-Baby" and "Brahm's Lullaby," which consistently had a soothing effect on T, her reaction to the sound of both flute and recorder had a contrary effect on the immediate behavior she was presenting. If T was restless and jittery during audition of the instruments, cessation of playing them would see T become gradually more tranquil. If, on the other hand, T was calm and restful during the playing of the instruments, T would become fretful and agitated when audition of the musical sounds ceased. Whatever behavior T was exhibiting, it was as though she would behave in contrary fashion in order to have the music commence once again.

T resisted each attempt I would make to have her touch the instruments. During the playing of the instruments, I gently touched her arm, hoping that she might sense vibrations emanating from them. Invariably T would reject the instruments, not by pushing them away, but by withdrawing her hands to her chest and occasionally shaking them. This was accompanied by grimaces.

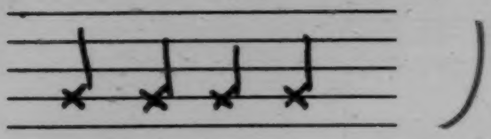
T was fascinated with the popping sound of the flute keys, an effect produced by quickly and firmly depressing the keys but not blowing in the instrument.

> I rhythmically imitated T's teeth clicking sounds by popping the flute keys in imitative, echo-like, fashion.

Teeth



Popping flute keys



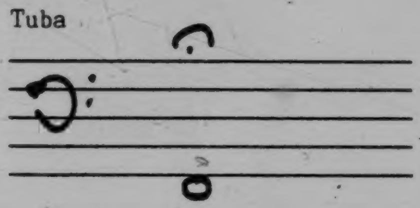
There was (accidental?) eye contact momentarily as T looked at me while I was popping the keys. My attempt to elicit an imitative teeth clicking response from T was not successful. T did attend well to the popping of the flute keys for thirty seconds. I manipulated T's fingers on the keys to enable her to pop them herself. Again, as before, T withdrew her hands to her chest, shaking them as she did so.

The session lasted thirty minutes. T's attention span was broken only once during the session and that was when she attempted to get out of her chair. To have been attentive to the musical sounds for nearly thirty minutes while attempting only once to get up and walk aimlessly about as T so often does when allowed to do as she pleases, indicates the extraordinary potential of musical sound to positively influence and shape her behavior. To have captured T's interest for nearly thirty minutes when her attention span is frequently less than one minute, also indicates the tremendous potential of using the flute and recorder as teaching tools in T's educational training.

Trumpet - Tuba

March 26, 1986 10:00 a.m.

T sat directly in front of me in the small observation room. Neither the size nor the shiny surface of the tuba which I held on my lap and directly in her line of vision, attracted T's attention. T sat quietly with slight rocking movements. Occasionally T would lift her right hand to her face, and with peripheral vision, study her fingers which she held off to the side of her head. There was cessation of this activity as I began to play a sustained F on the tuba. T became very attentive.



As I increased both rhythmic and melodic musical activity, T became more agitated. There were more animated bodily movements, including increased rocking, clapping, beating of her hands on her leg, grimaces and clicking of teeth. These movements were accompanied by high-pitched vocalizations and squeaking noises. T did not appear to be disturbed by the tuba sounds but seemed to be responding happily. It appeared as though a number of times T was actually smiling gleefully as she heard the tuba sounds. Because of T's frequent and habitual teeth clenching and facial grimaces, it was difficult to ascertain whether or not she was actually smiling or just exhibiting more of the clenching and grimaces.

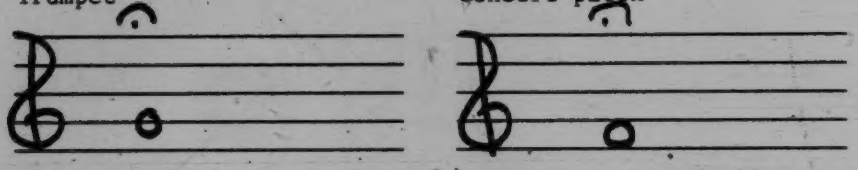
My personal reflections as to the differentiation between T's smile and her facial grimaces are recorded as follows:

I recall the difference in facial expression between T's smile and her teeth clenching grimaces which occurred during 'circle' time in her classroom. Upon hearing the sound of the vibrator machine, T very obviously smiled with delight. When the vibrator machine was gently placed upon her leg to enable her to experience the sense of vibrations, T's happy smile changed to a tight-lipped grimace, which, to an outside observer just coming on the scene, could very easily be mistaken for a smile. Each time I observed this phenomenon, T would smile gleefully upon hearing the buzz of the vibrator machine motor. The relaxed, happy smile would change to a taut-cheeked grimace when the machine was touched to her body.

Cessation of playing saw T lift her right arm to her face and engage in stereotypic finger gazing so common with autistic children. T rocked and made squeaking sounds as I played through a number of nursery rhymes including "Rock-a-bye-Baby" and "Brahm's Lullaby" which she hears from her musical doll. T remained very attentive but continued her rocking motion. The playing of these two tunes on the tuba did not have the calming effect that it did when played on the flute.

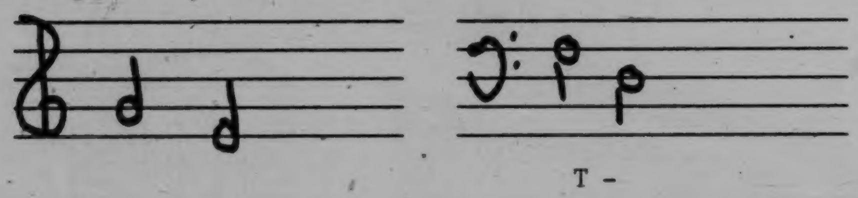
T remained in her chair as I put down the tuba and picked up the trumpet. During the silence T became more restless and presented both body and head movement that was not exhibited during audition of the tuba.

A sustained G on the trumpet


Trumpet Concert pitch

brought about a cessation of the body and head movement indicating a possible perceptual awareness of the difference in pitch, timbre and/or intensity between the tuba and the trumpet.

The only exceptional overt reaction to the trumpet sounds was in response to T's name theme.



Trumpet Concert pitch sung

The playing and singing of T's name theme elicited squeals of laughter, giggles and much excited bodily animation in the form of rocking, hand-flapping and clapping.

In the midst of T's animated excitement I cupped the bell of the trumpet over her knee to enable her to sense sound and vibration simultaneously, much in the same way she has experienced sound and vibration from the vibrator machine in her class 'circle' time. There was a slight withdrawal. Only when I placed the bell of the trumpet on T's arm while continuing to play softly did she totally reject the instrument. At this point T pulled her arm to her chest, clenched her teeth, presented a facial contortion which expressed extreme distaste and placed a finger in her left ear. I withdrew the trumpet but continued to play very softly "Brahm's Lullaby." T assumed a fetal position in the chair and began to make 'cooing' sounds.

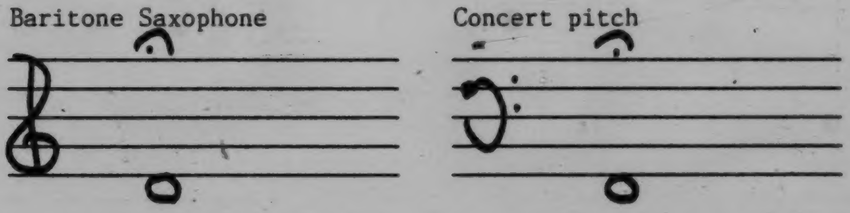
This body position accompanied by the 'cooing' sounds prompted personal questions as recorded below.

> Was T withdrawing totally from the sounds and feelings she was experiencing? Or, were the pianissimo sounds of the trumpet, coupled with the gentle vibrations empathetic to a regressive state, a state to T reminiscent of warmth and security? One of Benenzon's objectives is to expose autistic children to sounds empathetic to their regressive state in hopes that there might occur a rupture in the defensive nuclei of the child. This would eliminate the defensive barriers often erected by the child and would increase chances of opening up channels of communication. Perhaps the sounding of "Brahm's Lullaby" on the trumpet prompted in T an imitation of her bed-time behavior at which time she frequently hears the same tune played from her musical doll.
>
> I did no more at this point. I encouraged T to get down from her chair and we walked to her classroom. The musical session lasted thirty minutes.

Alto Saxophone - Baritone Saxophone

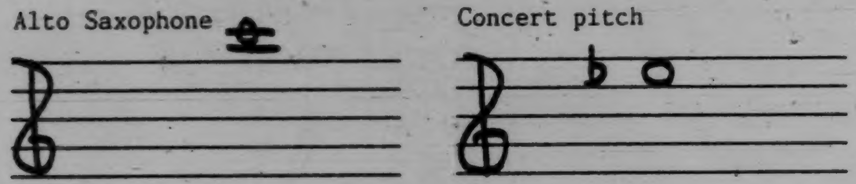
April 11, 1986 10:00 a.m.

The musical session with the saxophones took place in the observation room, a small room with two chairs and a table. T sat in a chair directly in front of me. I began the session with the baritone saxophone playing a sustained low D at a very soft level of intensity.



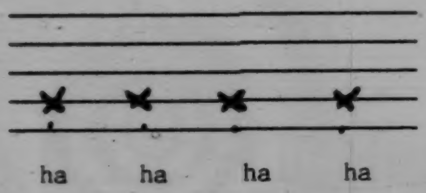
T's awareness of the sound was manifested by an increase in body movement. I continued playing both extemporaneously and nursery songs that were familiar to her. T was very attentive throughout the ten minutes of audition on the baritone saxophone but did not respond to any of my musical attempts to have her match the speed of her body and head movements with the tempo of the music I was playing. Throughout the ten-minute period of playing the baritone saxophone, T continued with rocking motions and head movements. These movements persisted throughout audition of the sounds and were done calmly but without any eurhythmic relationship to what I was playing. T ceased the animated body and head movement. Her legs were crossed and she rested her head on her knees and remained in this position. I quickly put down the baritone saxophone and took the alto saxophone from its open case under the table. T appeared oblivious to the change of instruments until I began playing.

With her head down still resting on her knees, I began to play a high C on the alto saxophone.


Alto Saxophone

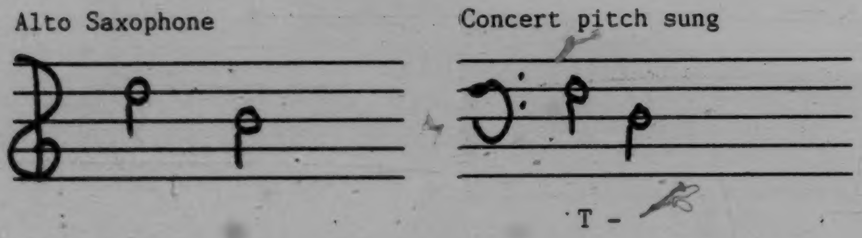
Concert pitch

There was an abrupt response. T sat up straight in her chair, held a wide grin (not a grimace) on her face, and began to make punctuated, guttural sounds. The sounds were without inflection or identifiable pitch. They were done in staccato-like fashion, one detached from the other, and with no pitch change.



There was a perceptual awareness of timbre and/or pitch change which obviously pleased T for she began to smile and emit squeals of high-pitched laughter. These bursts of laughter were repeated several times.

I played and sang T's name theme.


Alto Saxophone

Concert pitch sung

T emitted guttural, throaty sounds which I perceived to be T's attempt to imitate her name theme. These sounds were different from the punctuated staccato-like 'ha, ha' sounds emitted earlier. These new sounds appeared to be an attempt to respond although there was no rhythmic accuracy or pitch identification in her response.

T resisted touching the instruments. I placed the alto saxophone on her arm as I was playing so as to enable her to sense the vibrations emanating from the instrument. T withdrew her hands to her chest as I did so. As I persisted, T would place her hands over her ears when I touched her body with the instrument. This behavior was a rejection of the tactile sensation rather than the auditory one as T did not cover her ears when I continued playing but kept the instrument away from her body. It was only when I came closer to touch the instrument to her arm or leg that she would resist. I increased the dynamic level to a very high intensity to see if it was the loudness that T was rejecting. She made no attempt to cover her ears when I played fortissimo. T rejected the instrument and covered her ears only when I attempted to touch the saxophone to her body. At one point, with her hands over her ears, I stepped back from her and ceased playing completely. T's hands remained on her ears for twenty seconds after I had ceased playing. When T removed her hands from her ears I began playing again softly. T attended quietly with only slight rocking motion. She did not cover her ears again.

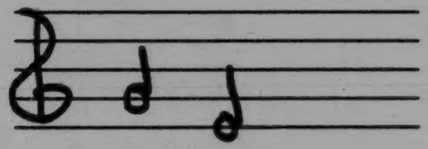
T seems to enjoy everything I play on the instruments. It is extremely difficult for T to sit quietly for long periods of time, yet she sat very attentively for this thirty minute session.

Clarinet - Bass Clarinet (repeat)

April 16, 1986 9:30 a.m.

T was taken to the washroom so as not to see me as I came into the classroom with the instruments and taking my place behind the one-way window screen. T was brought back to the room and wandered about among the six other children and three teacher aides that were in the room. I played, but did not sing, T's name theme.

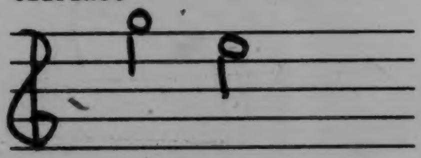
Bass Clarinet



The sound modified her behavior. T tilted her head and presented a grimace (smile?). I sang her name theme and T emitted several high-pitched vocalizations - an attempt to sing (say) her name? The more I played, the more agitated T became. She continued to wander about the room but more excitedly than before the sound began. T was making an attempt to locate the sound. After two minutes of walking through the room, T came behind the screen, sat down at my side for thirty seconds and got up again. There was no eye contact nor did there appear to be any perceptual awareness of cause-and-effect. T seemed totally oblivious to the fact that it was I who was playing the instrument. She had, however, searched out the sound and had located it. Upon getting up from beside me, T remained near the back of the screen, presenting squeals of laughter, hand-flapping and grimaces (smiles?).

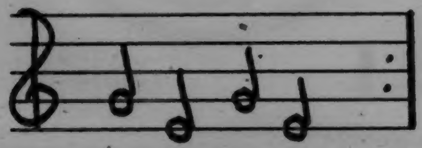
T eventually made her way out to the front of the screen. I took the clarinet and began playing T's name theme in the high register to see if the extreme difference in pitch range would elicit an immediate reaction as it did when I switched from baritone saxophone to alto saxophone.

Clarinet



There was no overt reaction. T lay on the floor during the audition of "Brahm's Lullaby" and the Bach Chorale "O Sacred Head Now Wounded." T remained calmly on her side sucking her thumb as I continued playing these two songs, first on the clarinet and then on the bass clarinet. The playing of these tunes seemed to have a sedative effect on T. I repeatedly played the last two notes of the "Bach Chorale." These two pitches make up T's name theme.

Bass Clarinet



T rolled over to look in the direction of the screen, grimaced and began clicking her teeth. I ceased playing and T began again to wander aimlessly throughout the room. I had played for T for twenty minutes.

Alto Saxophone (repeat)

May 7, 1986 10:00 a.m.

Although my purpose for being in the classroom at this particular time was to observe J's response to the sounds of the alto saxophone, I also noted some of T's reactions to the sounds. T was one of six other children in the classroom at the time. A very noticeable response was that T managed to locate the direction of the sound's origin and, within a matter of minutes, made her way behind the screen to where I was playing the instrument. T remained behind the screen as I continued playing. I was observing J as I did so and, therefore, was not fully absorbed in watching T's actions. T did, however, remain near me behind the screen as I played for J's benefit. Some few minutes later, T walked to the table in the center of the room, remained standing and put her head on her arms on the table as if taking a 'standing' nap. The music from the alto saxophone seemed to have a sedative effect upon T. This relaxing effect, if true, is consistent with the effect some of the other instruments had on T.

The Researcher's Role

The data presented above in the form of field notes is both descriptive and interpretive. The researcher-in-circumstance role required the utmost rigor in describing and analyzing the phenomena observed during the music sessions with the children. To be so closely related to the children and the setting as a researcher, participant, performer, and observer, suggests that the data be analyzed from a personal perspective and from an interpretive stance. The present study, in order to uncover meanings of responses, depended on good judgment, precision of description, and stringency in meaning of personally perceptualized interpretations. While most of the data are the result of personal perceptions, intersubjective data in the form of parent and teacher responses is also presented. Although all of the parents were invited to observe the music sessions with their children, only one parent attended the sessions (see Parent-Teacher Responses, Appendix VII).

Triangulation of the Data

Triangulation of the questionnaire, interview, and observational strategies minimized the import of questions which surfaced to challenge the credibility of the study. Parental and teacher responses to the study lend support to the reliability and validity of my own personal perceptions. Comments from the parents and teachers further indicate that the findings are a result of investigating that which was set out to be investigated. According to Kvale (vol. 14, no. 2), one form of validation is the extent to which a method investigates the content it is intended to investigate.

What was looked for

The question as to what was looked for must be addressed. It has been mentioned earlier that autistic children lack the ability or desire to communicate. When they do communicate there is usually such a disturbance in both cognitive and affective communicative skills that special devices must be found to draw them out of themselves and into meaningful social interaction. The wind instruments employed in the present study were the devices used to lure the children out of their autistic shell and into higher levels of communicative contact with their environment. What was looked for was the children's reaction to the sound stimuli presented by the instruments. As well, each child's expressive response to these stimuli was observed. Rigorous observation of these reactions and responses was scrupulously recorded in my field note journal and on the Observable Response Charts.

Because autistic children seem to be oblivious to their environment, appearing blind and/or deaf when they are not, I looked for any sign which might indicate an awareness of or interest in the musical sound stimuli at three levels of functioning; the cognitive, the affective, and the motoric. Cognitive awareness of the auditory stimuli could be manifested by a smile, a gesture, a glance, or an emission of a sound. Channels of communication could be opened by encouraging the children to repeat their response. To have discovered a sound that evokes such responses is to have discovered the chld's ISO sound identity (Benenzon, 1982).

During the observation phases of the study I searched for an increase in the span of attention coupled with a desire to come into tactual contact with the instrument. Such a phenomenon would be indicative of the potential for the development of affective contact. Further, I looked for a desire to hold the instrument or to manipulate the valves or keys. A desire to do so would point to the possibility of opening up channels of communicative contact through gross and fine motor activity.

Concomitant with the search for cognitive, affective and motoric functional response to auditory stimuli was an awareness of response to other modalities of sensory stimulation. I was alert to the tactile, olfactory, and gustatory impact of the instruments on each child. For the exception of smelling and tasting (licking) the instruments, I encouraged these means of stimulation to help effectuate a communicative breakthrough with the children.

Reporting the Findings

During the observational phases of the study I was acutely aware of my multifarious role, as researcher, participant, performer and observer. Because I was so closely related to both setting and children, the reporting of the findings is, by necessity, subjectively interpreted. In a complex study such as this where an ideographic approach to research was employed to uncover causal relationships through logical and systematic, albeit subjective inference, rather than empirical experimentation, questions continually surfaced to challenge the study's reliability and validity. How much, if at all, the children saw the instruments merely as an extension of myself and were responding to researcher personality rather than musical sound, is a question which cannot be fully answered. However, each child's definitive response to the musical-sound stimuli as I played while hidden behind a screen in their classrooms lends support to earlier observational impressions that the children were indeed responding to the sound stimuli, and not to the researcher as a friend, therapist or teacher. Validity insofar as the study is concerned, is conceptualized as the adequacy and accuracy of a description as a representation of the child's response to musical-sound stimuli. Precision in description and stringency in interpretation were strived for throughout the study. Description, interpretation and discussion have been written as objectively as possible, reporting only those findings which were perceived by me as being true. What was found is covered in the following chapter and is, I believe, both accurately and reliably reported.

Summary

This chapter has presented the various forms of data collected during the study.

The first section dealt with the Background Data and the data collected from the Teacher-Questionnaire and Parental-Interview. These data brought in new and insightful information relative to each child's socio-historical and music-sound background.

The following sections presented the data abstracted from the observational phases of the study. These data included the description of the children's responses to the auditory, visual and tactile stimuli posed by the wind instruments employed in the study. As well, Parent-Teacher Responses and the immediate overt responses of the children were presented as recorded on the Observable Response Charts (see Appendix VII and Tables 1-36).

CHAPTER V

INTERPRETATION, DISCUSSION, CONCLUSIONS AND RECOMMENDATONS

The purpose of this chapter is to interpret and discuss the data and to set forth the conclusions and recommendations of the research study. The purpose of the study was to investigate the potential of wind instrument sound as a nexus for communication with autistic children. The quest for answers relative to the purpose of the study was guided throughout the research by the question, "Can wind instrument sound with its comcomitant properties of timbre, pitch and intensity, be used as a nexus for communication with autistic children?"

Unlike the more traditional forms of scientific inquiry which collect data through the use of formal instrumentation, translating these data into various kinds of numerical indices, and finally attempt to generalize in some way, this study attempted to give rich, well-grounded description and explanation to observed processes which occurred within local contexts. The study focused on a different perspective of knowedge and a different way of arriving at conclusions - one based on participatory involvement, empathy and experience. The strategy, rather than mechanistically manipulating predefined sets of variables, attempted to establish sufficiently familiar relationships with C, J, and T in their own settings so as to allow defining characteristic traits to emerge from interaction between each child, the wind instruments and myself.

Data analysis occurred both concurrently and subsequently to data collection. The reduction of data - the selection, focusing and abstracting of raw data as it appears in edited field notes, the data display (Observable Response Charts), and the drawing of conclusions, were all part of the analytical process.

The purpose of the study was to investigate the potential of wind instrument sound to establish a communicative nexus between C, J, T, and myself. The process of discovering and explicating this potential for communication unfolded at three levels during the study. These levels were, 1) the diagnostic level, 2) the therapeutic level, and 3) the educative level.

At the diagnostic level an attempt was made to discover through the audition of eight wind instruments, a sound, or parameter of that sound which would be empathetic to each individual child's internal sound identity, their ISO sound. The instruments employed in the study were selected in familial pairs to allow for greater flexibility in pitch-range while, at the same time, maintaining a consistency in the generic timbre of the instrument.

The generic sound of the saxophone family, for example, could represent the timbre that best empathizes with a child's ISO sound. If the child's ISO sound is sympathetic to low-pitched sounds, an alto saxophone, for instance, because of its limited low range could not fully coincide with the child's ISO sound. By using a baritone saxophone, the generic sameness of saxophone timbre is maintained while at the same time the pitch-range is extended lower by one octave. By using the instruments in familial pairs, the child is exposed to an extended pitch-range while the tonal property of timbre remains basically static.

At the therapeutic level of the study, the instrumental sounds discovered during the diagnostic level to be empathetic to the child's ISO sound were used to foster and encourage deeper interpersonal relationships and greater social and communicative contact with the environment.

A major thrust of the educative level of the study was to increase each child's awareness of cause-and-effect relationships through simultaneous sensory perception of auditory, visual and tactual stimuli. Other modes of sensory stimulation (olfactory, gustatory) were encouraged and employed in the study to enable the children to more fully discover themselves and the interrelatedness between their bodies, the wind instrument (both intangibly as a sound-vibration generator, and tangibly as an object to touch) and myself.

Interpretation, discussion and conclusions drawn from the study will be presented in order as they relate to the three levels of the research. The diagnostic conclusions will be presented first and will deal with C, J, and T individually, while conclusions inferred from the therapeutic and educative levels of the study will treat the findings in a more inclusive manner.

Finally, recommendations for further research endeavor and continued study in the area of musical sound as it relates to childhood autism will be presented.

Diagnostic Level

The diagnostic level of the study has as its primary objective the discovery of a sound or set of sounds which are empathetic to the ISO sound principle of the child. As a technique for clinical application, the diagnostic level of the study employed the use of eight different wind instruments presented and played before each child in familial pairs i.e., recorder-flute; clarinet-bass clarinet; alto saxophone-baritone saxophone; trumpet-tuba. The audition of these instruments took place in a setting natural and familiar to the children, their school, and/or their home.

The initial attempt to educe an observable response from each child was through the sounding of a single sustained tone from each of the instruments. This tone was a concert F. This particular pitch was chosen because it lies in a comfortable vocal range for children the ages of C, J and T. Should there be any attempt from the children to imitate the sound of the instruments, the pitch, because it is in a singable range, could be easily matched by the children without any undue strain on their vocal chords.

No rhythmic or melodic musical components were initially employed. During the course of audition during each music session, new pitches were added to the sustained F. As well, intensity levels were changed and melodic and rhythmic elements were added. Other modalities of sensory stimulation were presented (olfactory, gustatory, tactile-vibratory) to enable the children to more fully experience both tangible and intangible elements of the wind instruments.

Interpretation, Discussion, Conclusions and Recommendations

Relative to C:

There is evidence that the instruments of lower compass produced musical sounds empathetic to C's internal sound identity, her ISO sound, at least empathetic enough to make communicative contact with her and hold her attention for periods of time much longer than is usual for her. Observation suggests that C responds and attends to the sounds of the bass clarinet, the tuba and the baritone clarinet.

To the contrary, it was evidenced that C neither rejected or had a tendency to avoid the instruments of higher pitch. The exception was the flute. C registered her rejection of clarinet sounds from clarion and altissimo (high registers) by covering her ears. Further rejection of the clarinet was manifested by C's attempt to push the instrument away from herself. C also pushed the instrument away from me. But this action was taken as a sign of jealousy, that C wanted nothing between her and myself. C was disinterested in the recorder and placed her finger in her ear at one point during audition of that instrument. A further indication of C's aversion to the higher-pitched instruments employed in the study was revealed in her tactual avoidance of the trumpet in favor of the tuba and the momentary covering of her ears during audition of the alto saxophone.

In attempting to ascertain the sound that was empathetic to C's ISO sound identity, information gathered from other sources of data collection employed during the course of the study was most helpful. The parental-interviews were especially helpful in that they alerted me to C's aversion to high frequency sounds and cautioned me to use the higher-pitched instruments with restraint.

The conclusion that C rejects and/or avoids the higher-pitched instruments used in the study is supported not only by data abstracted from the parental-interviews, but by observation of C's evasive responses to those instruments.

Observation suggests that C has a proclivity for low-pitched tones produced on the bass clarinet, the tuba and the baritone saxophone. An uncharacteristic attentiveness to the single sustained tones produced on these instruments, tones which were devoid of any melodic or rhythmic elements, and which caused C to cease or alter activity previously engaged in, points to the probability that the low-pitched sound produced on these instruments coincides with C's ISO sound identity.

C's reaction was definitively different during audition of the bass clarinet sounds as compared to her reaction during audition of the clarinet in the high register. It was possible to establish and maintain communicative contact with C during the course of the bass clarinet audition. As well, the bass clarinet sounds caused C to either cease and/or alter her activity. The clarinet sounds did not. The hearing of the bass clarinet sounds greatly increased C's span of attention, expanding the duration of her attentiveness to levels far beyond that which was normally characteristic of her. This phenomenon was attested to by C's mother who viewed the music session from behind the one-way window in the observation room.

Although C responded to the vibrations from the clarinet, it was apparent that she was rejecting the high-pitched sounds generated on it. Having observed that the bass clarinet sounds, and to a lesser degree the chalumeau register (low range) of the clarinet, were capable of inducing in C a tendency to respond in an attentive manner, a differential diagnosis had to be made between the sounds of the other low-pitched instruments. This diagnosis was needed to determine whether or not it was singular preference for bass clarinet timbre which made such an impact on C, or whether it was general preference for low-pitched sounds independent of the other tonal properties of the instrument.

In a further attempt to differentiate between C's response to the tonal properties of timbre and low-pitched frequencies, the tuba, with its distinctively different tone quality (timbre), but comparable pitch range, was used. C's interest in the tuba was immediate. Data abstracted earlier from the teacher-questionnaire and the parental-interview indicated that C usually showed considerable interest in bright and shiny objects. The tuba, with its brightly lacquered surface, was no exception. C's visual contact with the instrument induced a desire to explore the instrument tactually. For several minutes C's curiosity was manifested by touching the tuba, caressing its surface, running her fingers along the circumference of the bell and reaching and peering deep within the bell's opening.

The initial sound C heard from the tuba was a sustained F concert played pianissimo (very softly). The tuba sound evoked a definitive response from C. The sound of the tuba, added to the stimuli already resulting from visual and tactile modes of sensory perception, seemed to induce in C an even greater curiosity about the instrument. There appeared to be a perceptual awareness that the instrument was not merely a tangible object from which could be derived tactile and visual sensory pleasure. C seemed to know that the tuba was capable of producing auditory (intangible) sensory pleasure as well.

Unlike the trumpet, which was also used in this particular musical session, C manifested no rejection or avoidance tactics in her response to the tuba sound. On the contrary, the tuba sound captured C's attention and was able to maintain her interest above and beyond the interest which was already apparent due to visual and tactile modes of sensory stimulation. At this point in the music session, only a single tone had been played. There were no melodic or rhythmic elements employed, nor was there a change in dynamic intensity. The single sustained note (F) was played very softly throughout. C's attentiveness and apparent attempt to concentrate on the sound of the tuba suggest that the tonal property of pitch, specifically pitches of low-frequency best coincide with C's ISO sound. In that the timbre (tone quality) of the tuba and the bass clarinet are recognizably different, even, I must assume, to the ears of the autistic child, my own conclusion was that it is the low-sounding pitch frequencies of these two instruments more than the timbre (tone quality) of them that empathizes with C's ISO sound identity.

Additional observation of C's attentive response to a low-pitched instrument further substantiated my conclusion. Unlike the tuba, with voluminous but rich and velvet-like tone quality, and the bass clarinet, with a delicately smooth texture to the sound in its lower range, the baritone saxophone, when played in its lower range, has a coarse, somewhat raspy, harsh and penetrating tone quality. C's protracted, observant and attentive response to the baritone saxophone (as opposed to the higher-pitched alto saxophone which was used in the same music session) supports earlier evidence that C's preferential sound centers around a cluster of low-pitched tones irrespective and independent of the timbre (tone quality) resident in those pitches.

The dynamic intensity of these tones appeared to be of no consequence. Only when played at an extremely loud level was there a startle response. At all other dynamic levels from soft to loud, communicative contact with C was maintained.

Results from the diagnostic (participant-performer-observer) phase of the study have led to the following conclusions relative to C:

1) C has a tendency to reject and/or avoid sounds from the higher-pitched instruments employed in the study.
2) It is not one instrument only but the three low-pitched instruments used in the study (bass clarinet, tuba, baritone saxophone) that can be used as an approach to therapy with C.
3) Channels of communication with C were established, based on C's empathy with low-frequency pitches, irrespective and independent of the tonal properties of timbre or dynamic intensity.

Specific recommendations relative to further work with C, are:

1) to avoid those instruments, the compass or range of which lies above a middle concert C.
2) to further pursue the use of the bass clarinet, the tuba and/or the baritone saxophone with C.
3) to strengthen the very basic links of communication with her, which have already been established through the audition of these instruments.

Interpretation, Discussion, Conclusions and Recommendations

Relative to J:

Observation of J's response to the wind instruments employed in the study suggests that J has an acuity for musical sound which is more advanced than one would expect, given the physical and mental anomalies she presents. In spite of the fact that J presents cognitive delays, perceptual anomalies, physical abnormalities~~,~~--and several other characteristic traits attributable to the syndrome of autism, she demonstrates a rather high perceptual awareness and auditory discrimination to musical sound. This awareness is indicated by her definitive response to the different tonal qualities of the eight wind instruments used in the study. J also demonstrated a capacity to respond motorically in an appropriate manner to rhythmic stimuli.

The attempt to diagnose J's ISO sound through discovery of a sound which coincided with her preferential sound identity was complicated by the fact that J responded and attended well to seven of the eight instruments utilized in the study. The recorder was the notable exception. Although the goal of the diagnostic level of the study, the discovery J's ISO sound, was problematic in that she attended well to nearly all of the instruments, the problem was welcomed in that it would allow for greater flexibility and an expanded auditory spectrum in the attempt to build strong links of communication with her during the therapeutic and educative phases of the study.

The sound of the clarinet, perhaps more than any of the other instruments, made the greatest impact on J. J's initial response to the single sustained G on the clarinet (F concert) is defined by an attentive posturing of both her head and her body, accompanied by what appeared to be intense concentration on the auditory stimulus - the single clarinet tone. Further responses as I began to randomly change pitches on the instrument were a breaking of J's concentration and her statue-like posturing. J would suddenly burst into gleeful laughter and happy vocalizations, the latter being spontaneous and non-sensical with no apparent communicative purpose other than the reflection of the experiencing of auditory pleasure. These reactions were accompanied by self-stimulative behavior in the form of hand-flapping and animated bodily movement.

As I increased rhythmic activity on the clarinet, J responded appropriately with increased and quicker body movement. These movements did not appear to be spontaneous, disjunct or unrelated to the sound-rhythm stimulus J was hearing from the clarinet. J was moving in imitative response to the music. Observation of J's eurythmic response to the increased sound-rhythm of the clarinet suggests that the clarinet sound coincides with her preferential sound identity, her ISO sound. The tonal properties of the clarinet coupled with the sound-rhythm elements of the music I was playing made a definite impact on J. We were communicating. J's volitional eurhythmic response to the clarinet, a response based on non-verbal stimuli, verifies the hypothesis that the penetration of a sound which is empathetic to an autistic child's ISO sound, can surmount defence barriers erected by the autistic child. The sound-rhythm stimulus generated on the clarinet elicited from J a form of non-verbal response. A bridge to communication had been established.

Continued audition of the clarinet supports evidence that the clarinet sound made an impact on J at the cognitive level. The quicker tempi (increase and fluctuation of the speed of the music) and the increased rhythmic activity were apprehended by J. She was able to translate apprehension of the musical message into appropriately matched motor response.

The sound-rhythm elements of the clarinet also educed an echolalic vocal response from J. Echolalia, a characteristic trait common to many autistic children, is the echoing of words or phrases that the child has heard in the past (delayed echolalia), or a parrot-like repetition of what has just been heard (immediate echolalia). Results from further auditions of the clarinet indicate that J responded to the clarinet sounds in echo-like imitation of the vocal sounds emitted by her at bedtime. I had heard this ritualistic emission of vocal sounds while in J's home one evening during her bedtime. The four to five detached sounds were accented grunts without identifiable pitch and with no change in inflection. J frequently emits these sounds in this same manner as she is falling asleep.

In one of our music sessions at the school, I repeated four accented, detached middle C's (Bb concert), all of equal dynamic intensity and duration in an attempt to replicate both rhythmically and stylistically J's bedtime vocal sounds. J responded in exact imitation. The vocal emissions, although not matched in pitch, were matched in rhythm, tempo and style. J respond~~ed~~ vocally with four accented, detached sounds of the same duration and speed that I played on the clarinet. I repeated the four-note sequence and J responded in like manner. Additional attempts to evoke a similar response were met only with bursts of laughter. There was intense eye contact between J and myself during this part of the music session.

To have discovered a sound that penetrated the defensive shell of a non-verbal autistic child, inducing a tendency to volitional vocal response, lends added support to my view that the clarinet sound, more than the sounds of the other instruments used in the study, is the sound most empathetic to J's ISO sound.

As was mentioned earlier, discovery of a singular instrumental sound which coincided with J's preferential sound identity, was complicated by the fact that J responded positively and enthu~~sia~~stically to seven of the eight instruments. The clarinet sound, and to a lesser degree the bass clarinet sound, made impressive impact on J. It was, however, the generic clarinet tone quality, the tonal property of clarinet timbre, independent of pitch, dynamic intensity, melodic or rhythmic components or other modes of sensory stimuli such as the visual or the tactile, that enabled a nexus of communication to be established between J and myself. At the same time J's definitive response to all the other instruments (the recorder being the exception) lend support to my view that there are tonal elements resident in the other instruments that attract J; and that these tonal elements, if coupled with other sensory modalities, especially tactual-vibratory, can be used in a therapeutic approach technique with J.

The introduction of live wind instrument sound in J's natural setting led to the following conclusions:

1) J shows an acuity for musical sound that defies the many physical and mental abnormalities she presents.
2) J shows perceptual awareness of melodic and rhythmic musical components.
3) J shows auditory discrimination of timbre and pitch.
4) The generic sound of the clarinet family empathizes with J's ISO sound.
5) Seven of the eight instruments employed in the study (the recorder being the exception) could be used in a therapeutic approach with J.

A specific recommendation relative to J would be to greatly expand the use of music in her training. A variety of all kinds of music should be employed both as a therapeutic approach and in the overall educative process. Further, evidence from the observation of J's response to the instruments points to the fact that, in time, J might be taught to respond vocally, perhaps verbally, by imitating the instruments. Also, I believe that in time, J's tactile defensivity, especially her aversion to reach out and touch an object, could be attenuated by first enabling her to enjoy the sound of an instrument preferable to her, and then, having been enticed by the sound of the instrument, to encourage and enable her to derive tactual pleasure through the sensing (touching) of the vibrations generated on that instrument.

Interpretation, Discussion, Conclusions and Recommendations Relative to T:

T suffers from severe mental retardation as well as many traits attributable to the syndrome of autism. The process of discovering T's ISO sound was greatly impeded due to her level of retardation. An attempt to circumvent this problem was made by observing T's response to the wind instruments at three levels of functioning. These levels were, the sensory level, the perceptual level, and the cognitive level. T's inability to function well at these levels rendered conclusive observational results extremely difficult so I could only infer functioning at these levels from T's reaction to auditory stimulus input and response output.

The lowest functional level and the first to develop in a child is the sensory component (Morgan, 1981). The sensory component includes reception of stimuli by eyes, ears, nose and other sense organs. In the musical sessions with T, the sensory stimuli involved the reception of auditory stimuli generated on the eight wind instruments employed in the study. Nearly all observation (participant-observation, and participant-performer-observation) focused on T's response output to sounds.

There were attempts to have T experience tactile stimulation by touching the instrument. These attempts were consistently rejected by T with the exception of one spontaneous, quick attempt to touch the clarinet during the music session involving that instrument. Visual stimuli were presented as well. By exaggerating finger movements on the keys or valves directly in T's foveal vision as I played, an attempt was made to have T make eye contact with the instruments. T avoided making eye contact with me and rejected any attempt to have her look at the instruments.

The first approach technique used with T was the single-pitch sustained F. T's overt response to this sensory stimulation was consistently an increase in bodily animation accompanied by grimaces and short squeals of laughter. T's definitive response to a single tone at the sensory level suggested a perceptual awareness to sound in her environment. I followed this by playing nursery rhymes familiar to T from a musical doll she listens to at home. It was in response to these nursery rhymes that T showed signs of cognitive and perceptual functioning. The playing of these nursery rhymes familiar to T evoked increased vocalizations, more animated body movements and happy smiles.

These overt responses cannot be attributed totally to T's recognition of familiar melodies however, as she exhibited similar responses to sounds which I played ad libitum (scale passages, arpeggios, melodic fragments, intervals), sounds which most certainly were unfamiliar to her. Nevertheless, the playing of these nursery rhymes, most notably "Rock-a-Bye-Baby," and "Brahm's Lullaby," saw T, upon four different occasions, assume either a fetal position or a bedtime posture during the playing of these songs. The fetal positioning was presented during audition of the trumpet. T curled up in a fetal position in the chair in which she was sitting while attending the trumpet audition.

Audition of the clarinet and bass clarinet saw T lie down on her classroom floor and begin to suck her thumb, knees pulled up tightly to her chest. During the music session with the baritone saxophone, T put her head on her knees while sitting in the chair and rested in this position throughout the duration of the song. The sudden change of sound resulting from a change to the alto saxophone brought T to an abrupt upright position. While hearing these nursery rhymes on the alto saxophone in the classroom, T walked to a classroom table, folded her arms on the table, put her head on her arms and appeared to be taking a standing nap.

It is quite common that auditory stimuli, although registered by an autistic child, frequently have little meaning or conceptual significance. In T's case, observation suggests that at the cognitive (thinking) level, there was a stirring of memory, a drawing of relationships and associations between her bedtime hearing of the nursery rhymes on her musical doll and the audition of these songs on the instruments used in the study.

Input from auditory stimuli was received by T, processed and projected outward through various physical responses such as laughter, vocalizations, facial grimaces, rocking and other bodily movement of hands, legs, head and torso. Benenzon (1981) has found that vibrations can stimulate psychic as well as physical response. The audition of the aforementioned nursery rhymes seemed to evoke a psychic response from T. This response was one of mnemonic associations which led to a perceptual awareness of melodic relationships between melodies played on the wind instruments and the same melodies played on the musical doll.

An indication of T's level of perceptual functioning occurred in the classroom as I played from behind a screen. As I played, I observed T's reaction through the one-way window. T's awareness of the wind instrument sound emanating from behind the screen was manifested by a cessation of her present activity and a change of focus. T began to walk about the room, not aimlessly as she so often does when not supervised by a teacher, but with more resoluteness and an apparent seriousness of purpose. T was attempting to locate the origin of the sound. After two minutes of searching, T did locate the source of the sound.

This manifestation of perceptual awareness relative to sound direction occurred at two separate music sessions in T's classroom setting. One manifestation was during audition of the clarinet and bass clarinet, the other during audition of the alto saxophone. Upon both occasions, T remained near me after locating the sound. However, there appeared to be no cognition of the fact that either I or the instrument had anything to do with the musical sound she had so assiduously sought out and found. Having sought and located the source of the sound indicates a level of perceptual functioning. Such a function is a step above and beyond mere sensory perception to auditory stimuli.

The attempt to discover T's ISO sound revealed that tonal elements resident in the clarinet, bass clarinet, the flute and the trumpet made an impact on T. The sounds from these instruments were successful in evoking responses upon which a communicative nexus could be built. The alto saxophone, however, made the greatest impact on T. The alto saxophone sounds educed a degree of response from T which suggested that this singular sound had ruptured the defensive nuclei and crossed barriers unsurmountable by the sounds of the other instruments.

In response to the alto saxophone, T was brought abruptly from a tranquil 'head-on-lap' position to one of alertness, attention and what appeared to be intense concentration. The alto saxophone tones elicited a wide grin and an emission of guttural sounding vocalizations. Each sound was detached from the preceding one, and was rhythmic, yet without identifiable pitch. This response appeared to be T's attempt to emit sounds imitative (echolalia) of what she had just heard played on the alto saxophone. Rather than responding with stereotypic behavior such as hand-flapping, rocking and facial grimaces, T was volitionally communicating through imitative vocal response to the alto saxophone. No other instrument used in the study induced in T the tendency to vocally imitate the instrumental sounds played for her.

Findings from the diagnostic phase of the study relative to T have led to the following conclusions:

1) At the sensory level, auditory input from the music stimuli produced on the wind instruments employed in the study, resulted in definitive response output.
2) T exhibits perceptual awareness insofar as sound direction and melodic memory are concerned.
3) The alto saxophone sound coincides with T's ISO sound and should be used as a first-approach technique to music therapy.
4) Tonal elements resident in the flute, clarinet, bass clarinet and trumpet are positively received by T and these instruments could be used in a therapeutic setting with her.

Recommendations for further work with T would be to employ the instruments positively received by her to assist in ameliorating her problem of tactile defensivity. T's aversion to touching objects might well be attenuated should she become so attracted to the sound of an instrument (my choice would be the alto saxophone) that she would volitionally reach out to touch it.

Also, further work with T in music should involve the use of melodies to help T establish associations between one appropriate behavior and another. T's fetal positioning response to nursery rhymes suggests that her perception of these melodies associates itself with sleep and/or bedtime activity. Melodies could be used at home or at school as a training technique to draw musical associations between appropriate behavioral response to eating, dressing, toilet training as well as other educational activities.

General Conclusions: Diagnostic Level

Results from the diagnostic level of the study lend support to the assumption that wind instrument sound, with the inherent tonal qualities resident in those sounds, does have the potential to penetrate walls of resistance erected by autistic children.

The conclusion can therefore be drawn that wind instrument sound can be used as an approach technique to both therapy and education in pursuit of a nexus for communication with autistic children.

Interpretation, Discussion and Conclusions: Therapeutic Level

According to Benenzon (1981), music therapy is a paramedical discipline which can be described in two ways. One way is scientific, the other is therapeutic. From the scientific viewpoint, music therapy is a branch of science that deals with the study and investigation of the complexities dealing with the impact of sound upon human beings, so as to discover the diagnostic elements and therapeutic methods inherent in it. From a therapeutic point of view, music therapy is a paramedical discipline that uses sound, music and movement to produce a link between the therapist and the patient. This link may open up channels of communication that will enable the beginning of a new process of training and recovery that will better prepare the patient for society.

The diagnostic level of the present study concerned itself with the discovery of each child's ISO sound. Conclusions drawn from the diagnostic level of the study determined the instruments and methodological approach to be used in the therapeutic phase of the study.

The therapeutic level of the study concerned itself with the opening up of new pathways of social interaction between C, J, T, and myself. The important part of the work in this phase of the study was done with the instruments discovered earlier in the study and considered to be empathetic with each individual child's ISO sound. To be in close proximity to the child, with the right instrument in hand and ready to play, allowed for immediate and spontaneous dialogue with the child. Such spontaneous dialogue allowed me to be ready for each changing mood, each problematic situation and each psychophysical response, precisely at the moment of occurrence.

In the diagnostic level of the study, the focus centered around exogenous auditory stimuli. External sound stimuli emanating from the instrument was projected inward, penetrating the child's consciousness. Audition of the sound stimuli (often the only stimulus being a single, sustained pitch) most always resulted in a psychophysical response. The nature of the response indicated either a positive reception of the tonal stimuli, or an avoidance or rejection of them.

In the therapeutic level of the study, the primary focus was on endogenous response, that is, the outward projection of an inward response. This response goes from predominantly within the child outwards. Exogenous stimuli work inversely to the stimuli employed earlier in the study, by inducing internal responses that will be projected outward, perhaps in the form of vocal emissions or motoric activity. An outward response projection resulting from external music sound stimuli enables the child to experience the emotion of movement through bodily animation, or the emotion of vocalization by emitting an audible vocal response.

Various modalities of exogenous sensory stimuli other than the auditory were experienced by the children during the study. These were visual, tactile, and, if initiated by the child, olfactory and gustatory modes of stimulation. All of these stimuli focused on or derived directly from the wind instrument being used at the time.

Auditory, visual and tactile sensory stimulation derived from the instrument(s) was encouraged. Smelling and tasting (licking) the instrument(s) was allowed initially and then discouraged. Each of these modes of external stimulation were encouraged or yielded to in order to educe endogenous communicative response from the children so as to enable them to open up outwardly towards their world and to communicate and become more fully aware of their environment.

As has been mentioned above, the initial external stimulus presented to each child is the auditory sound stimulus of the wind instrument. A notable exception to the initial use of musical tone to evoke psychophysical response from the child was the attempt to have C respond to a visual stimulus. Data collected from the teacher-questionnaire and the parental-interview revealed that C is attracted to bright and shiny objects.

Being cognizant of C's proclivity to objects that shine prompted me to exploit the bright, shiny surface of the tuba as a visual stimulus before she would be exposed to the sound of the instrument. The visual stimulus was provided by holding the tuba on my lap directly in C's field of vision, thus enabling her to see not only the brightly lacquered surface of the instrument but, as well, to see her own reflection in the mirror-like surface of the bell of the tuba. C responded immediately to the visual stimulus although she totally avoided her own reflection in the instrument. Not only did C study the tuba intently with searching eye contact, she herself initiated tactile stimulation by touching the surface of the tuba, running her fingers around the circumference of the bell and softly caressing the inner and outer surface of the bell.

In this instance, reception of the external (exogenous) visual stimulus prompted an internal (endogenous) response. The desire to project, outward, to reach out and sense the tuba tactually culminated in C's expressive, touch-response.

The links of communication already established through visual and tactile stimuli presented by the tuba, could have been weakened should C have been fearful of or rejected the sounds of the instrument. I assumed that C would not reject the tuba sounds in that she was positively receptive to lower-pitched sounds presented to her earlier on the bass clarinet, and, to a lesser degree, the pitches played on the chalumeau (lower register) of the clarinet. C's response to the added stimulus of tuba sound was marked by an intensified interest in the instrument.

While C was actively involved in touching the instrument, her head actually in the bell, I began playing a concert F very softly. There was no startle response, no manifestation of avoidance or rejection. C's definitive response indicated that she was hearing a sound empathetic to her ISO sound, her preferential sound identity. With intensified concentration, which was apparently focused on the tuba sound alone, as all other visual and tactual activity ceased, C tilted her head to one side as if contemplating the sound. C listened for thirty seconds to a single sustained tone (F) before putting her head more deeply into the bell of the tuba. By putting her head into the tuba during audition of the single tone, C was now manifesting positive reception to the tuba auditorily as well as visually and tactually.

In this particular instance with C, visual and tactile modes of sensory stimulation breached the walls of disinterest prior to the auditory stimuli. The auditory stimuli, being added to and coupled with visual and tactual modes of sensory stimulation, then served to reinforce C's interest in and attraction to the instrument. The simultaneous presentation of three sensory modalities, and the positive reception to each allows for a more in-depth use of an instrument such as the tuba for a teaching tool.

New pitches, melodies, and familiar nursery rhymes were then included in the music session with C. As well, C's name theme, based on a descending minor third (F-D), and my name theme, based on a descending perfect fourth (Eb-Bb), were repeatedly played and sung. C's name theme was sung one pitch to each syllable of her name. My name theme was sung, one pitch for each of the words, 'I'm Paul.'

Initially, C responded to the tuba sounds (not my singing) with guttural vocalizations which appeared to be an imitation of what she was hearing from the tuba. The responsive vocal sounds emitted by C suggest very strongly that the tonal properties of the tuba coincide with her ISO sound. Unlike vocal commands which result in a non-response from C, the external tuba sound seemed to have penetrated her consciousness, inducing in her a desire to respond.

C's attempt to respond seemed to intensify as I followed the playing of the respective name themes with the singing of them. C gave the appearance of actually trying to (wanting to) respond verbally in imitation of what I was singing. The ability to effectuate it was just not there. It was one week later, after repeating this process by repeatedly playing and then singing my name theme, that C responded. During audition of the baritone saxophone (which was played in the same pitch range as was the tuba), C sang out 'I'm Plah,' in response to my many entreaties to have her imitate the 'I'm Paul' theme I had played and sung to her repeatedly. The low-pitched sound frequencies of the baritone saxophone and the tuba before it, had evoked from C a clearly articulated response to the singing of my name theme. C had attempted to verbalize.

Like other therapeutic techniques, music therapy attempts to persuade and to influence positive changes in behavior in a patient. The foregoing description of C's response to the tuba and the baritone saxophone leads me to conclude that wind instrument sound, coupled with visual and tactile modes of sensory stimuli, can in C's case be used effectively to create diverse approach techniques capable of opening up channels of communication.

A short attention span and an inability to sit for long periods of time are problems which are mentioned frequently by those working with autistic children. J is no exception. Without direct adult intervention, J would be up wandering about the room, occasionally finding an object of attachment which would hold her attention, but rarely for more than a minute. The attainment of increased levels of attention was a concomitant goal of the study. The search for an external sound stimulus which would so impact the child so as to increase that child's attention span was a part of the work during the therapeutic phase of the study.

The aforementioned therapeutic effect of wind instrument sound was also observed during music sessions with J. A notable effect of wind instrument sound on J, was the capacity of this sound to increase her attention span. Data from the teacher-questionnaire called attention to J's very short attention span. Further information revealed that J rarely sat for longer than two minutes attending to one thing without adult supervision involving physical control of her activity. One of the expressed desires of J's teacher was to have J sit for at least five minutes attending to the task at hand.

Unlike C, whose attraction to the tuba was prompted first by visual and tactile stimuli then later reinforced by auditory stimulus of the tuba sound, J resisted nearly every opportunity presented to her to touch the instruments. Neither did she study them visually for more than a brief moment. J was, however, receptive to the sound-vibration stimuli presented her when the trumpet or the alto saxophone were touched to her body. While neither visual nor tactual modes of sensory stimuli from the instruments were capable of attracting J's attention, auditory stimuli from seven of the eight instruments used in the study, saw J focus her attention directly at me for periods of up to forty-five minutes. Only infrequently would J's interest turn elsewhere, and then only momentarily.

There were occasions during audition of the instruments when J would sit transfixed for ten minutes, the state of transfixation breaking only when I ceased playing and began speaking to her. There was a definitive difference between J's 'light-gazing,' or 'head up' response and the state of transfixation manifesting itself while I played the alto saxophone and the trumpet. A 'head up' response from J is an avoidance tactic, a clear indication that she is tuning out. During the transfixed state, J was not tuning out. Her attention was riveted on me. J's eyes, which were alive with excitement, were in constant contact with my face, while her facial expression revealed anticipatory interest in all that I was playing on the instruments. I came to the conclusion, therefore, that it was the auditory stimulus which so captured J's attention. Only cessation of playing broke J's state of undivided attention and resulted in self-stimulative behavior, frequently accompanied by bursts of laughter. However, during audition of the alto saxophone and the trumpet, J sat quietly with rapt attention, presenting no self-stimulating behavior.

Autistic children often live in an unreal world behind walls which they have erected around themselves. Music can often breach these walls and can help open doors to communication with these children. The essential fact is, according to Alvin (1975), that against the penetration of sound the child is defenseless. Often, the only way to help an autistic child is to exploit such defenselessness and literally, unrelentingly intrude on his/her detachment and avoidance in order to help him/her (Oppenheim, 1974).

In J's case, the walls of imprisonment or refuge which had been built up around her and which prevented her from attending well for long periods of time were breached by the auditory stimuli of the wind instruments, most notably the clarinet, alto saxophone, and to a lesser degree, the trumpet. In her defenselessness from preventing these instrumental sounds to penetrate her consciousness, J was helped. These sounds drew from J a response which enabled her to sit quietly and to listen attentively for periods much longer than were characteristic of her. J was learning to be attentive.

Additionally, the musical sounds brought joy and happiness into her life. J enjoyed the music sessions. This joy was made manifest through J's happy facial expressions, her bursts of laughter and her willing and protracted attentiveness to what I was playing. Concomitantly, the problem of J's phobia to touching objects was ameliorated. Attenuation of J's tactile defensivity was brought about through enticing her to sense the vibrations of the alto saxophone and the trumpet. The experience of simultaneously sensing sound and vibration was very obviously an enjoyable one for J. To reach out, on her own volition to bring the instruments in contact with her body in order to sense the vibrations is indicative of the fact that J derived a certain amount of pleasure from the vibrational stimuli. This phenomenon led me to conclude that sound-vibration stimuli from an instrument could very well be used as a nexus for communication between a music therapist and an autistic child. Further to this, J was learning to communicate. J's volitional response, in deliberately reaching out to draw an instrument inward to her body in order to more fully sense the vibrational stimuli coming from that instrument, enabled her, by non-verbal means, to express and communicate her desires.

During earlier music sessions with J, there was no attempt on her part to touch the instruments. Although J was responding positively to the musical sound stimuli from the instruments, she was rejecting any attempt to enter into tactual contact with them. Because of J's positive response to the musical sound stimuli, it became an objective in the therapeutic level of the study to allow the persuasive power of the musical sound to attenuate her apparent fear of tactual contact with the instruments. The process began with the trumpet. I perceived that J was enjoying both the sound stimuli and vibrational stimuli of the trumpet. Animated bodily movements, smiles, laughter and attentiveness to what I was doing, all pointed to the fact that J was deriving pleasure from the sound vibration stimuli of the instrument. During the course of audition I purposely withdrew the instrument and ceased playing very abruptly in order to allow J some form of expressive response to indicate her desire, or lack of desire, to have me continue playing. Surprisingly, J, with palm and fingers extended, reached out and swept the trumpet inward to her own body, indicating that she wanted the sound-vibration to continue. J and I repeated this process several times. She did not, however, fully grasp the instrument by wrapping her fingers around it. It appeared as though J was afraid to come into full tactual contact with the trumpet. J always communicated her desire to continue sensing the sound-vibrations of the trumpet by sweeping the instrument towards her body with extended arm and open palm. I saw this as a communicative response, whereas before, there was none.

It was with the alto saxophone that there was a definitive change in J's response to tactual modes of stimuli. During the course of audition with the alto saxophone I ceased playing in mid-phrase much the same way I had done in an earlier music session with the trumpet. Unlike before when J reached out with open hand, she now responded by taking the instrument in full-handed grasp, with all fingers wrapped tightly around the bell of the instrument, forcefully pulling the instrument to herself. Momentarily I sat astounded that J could communicate her want in so resolute a manner. In this moment of inertness, J took the saxophone again and shook it forcefully but not destructively. In a very convincing manner J was communicating her desire to have the sound-vibration continue. The sound-vibration of the alto saxophone presented such persuasive power that it (the sound), coupled with the sense of vibration, was capable of ameliorating the fear of tactual contact with an object. In J's case, therapeutic use of the wind instrument sound and sound-vibration were capable of mitigating tactile defensivity while at the same time drawing out new ways of communication from her.

Many therapeutic results that were observed while working with C and J, were also observable in T. It was observed that T's attention span during audition of the instruments was extended far beyond that which was normally characteristic of her while engaged in other listening tasks. To have captured T's interest for periods of up to thirty minutes whereupon she listened attentively without attempting to get up and move about, implies that T was deriving a high degree of pleasure from the wind instrument sounds. To have extended T's attentional behavior to thirty minutes (flute and saxophone) suggests the tremendous potential inherent in these instruments to be used as tools for therapeutic and educational purposes.

It was the alto saxophone that I perceived to be the instrument which best coincided with T's ISO sound. Inherent in the tonal attributes of the alto saxophone seemed to be the capacity to induce in T a tendency to respond vocally, to imitatively respond to the sounds being played on the instrument. By penetrating her consciousness, the alto saxophone sound seemed to release in T a desire to imitatively react to the sounds. The cathartic value of such a release cannot be fully measured. However, observation of T suggests that the emotional outlet through the imitative emission of these sounds had a liberating effect on her. The emission of these imitative sounds was followed by squeals of laughter and sustained smiles. It was as though T was expressively projecting outward a new found inner joy and excitement, and that she was cognizant of her effort to imitate the sounds of the alto saxophone and was pleased with herself for doing so.

It should be mentioned here that it was the auditory stimulus alone of the alto saxophone that was evocative of a response from T. Visual, tactile and every other means of sensing the instrument were rejected by her.

The therapeutic effects of hearing melodic material familiar to T were also evident during audition of the instruments. T would often assume a fetal position or some bedtime posture suggesting sleep when I would play nursery rhymes familiar to her from a musical doll to which she listens at home. I played these tunes on several of the instruments and they seemed to have a quieting, sedative effect on T. The therapeutic value of this resides in the mnemonic associations T makes between the melodies from her doll and the same melodies played on instrument such as the alto saxophone. The melodies, whether played on her musical doll at home, or played on a wind instrument in the school seem to be cognitively associated with sleep in T's mind. Therapeutically, the employment of familiar melodies such as these could be used to pacify T and quiet her when she is restless and agitated.

There are a number of conclusions to be drawn from these observations as they relate to the therapeutic level of the study. These conclusions are:

1) Tonal attributes of wind instrument sound (auditory stimuli), independent of other modes of sensory stimulation, were therapeutically effective in bringing about positive change in behavior in C, J and T.
2) Other modes of sensory input such as the visual and the tactile, coupled with auditory input from the wind instruments, were successfully used to establish channels of communication between C, J and T, and their environment.
3) The clinical use of wind instruments as a non-verbal therapeutic approach technique increased interpersonal communicative contact between C, J, T and myself.

Discussion and Conclusions: Educative Level

It has been stated earlier in the study that the therapeutic and educative levels of the study occur concurrently. Education and therapy are so closely linked in their application to the autistic child, that they will one day merge and be indistinguishable or at least blurred in some hands as we approach the autistic child, teaching methods, and therapy. "Indeed, with autistic children, therapy at its best is education and education at its best is therapy" (Shapiro, 1978).

Shapiro (1978) postulates that researchers in autism have gone through a gamut of investigative and therapeutic possibilities which exist in such an array of profusion, the variety itself is testimony to the fact that there is no adequate therapy in the current state of the art which will withstand controlled investigation. "Until our data are firmer, many therapies will continue to exist. Moreover, individual parents will reach out longingly to a vareity of aids and some will even gain considerably from a variety of professions" (p. 366).

By allowing their children to participate in this study, the parents of C, J and T were in a sense reaching out to me for help. Results from the study point to the possibility of 'considerable gain' for their children. Increases in communicative contact, attention span, imitative response, awareness of cause-and-effect relationships, as well as positive gains in other areas, all point to the powerful potentialities of wind instrument sound as a tool for therapeutic and educative gain for autistic children.

In that therapy and education are so closely linked as they apply to autistic children, many of the positive therapeutic gains from the therapeutic phase of the study can be said to be educational gains as well. One of the most notable therapeutic-educative gains with all three of the children involved in the study was the substantial extension of their attention spans. Data gathered from the teacher-questionnaire, the parental-interview, and in private conversation, without exception, pointed to concern over the short attention span of all three girls. To have captured and held the attention of all three children for periods significantly longer than is normally characteristic of them suggests that the children were having a pleasurable experience.

Perhaps they were experiencing joy, a "joy that was deeper than fun, and a happiness greater than enjoyment" (Alvin, 1965). The therapeutic significance of this increased level of attention is that the children were experiencing something that brought them pleasure, enough pleasure to sit quietly and attentively for long periods of time, perhaps never before attained. Educationally, this significant increase in the span of attention points to the potential influence of wind instrument sound to ameliorate the problem of inattentiveness in the autistic child. Kitahara (1984) addresses the autistic child's problem of attending by stating that

> Autistic children have a characteristic trait of concentrating on anything that attracts their attention and getting a fixation on it. If this tendency is conversely utilized in guidance methods, an interest in study is aroused in the

> autistic child, it exhibits a power of concentration, responds well to repeated training and can attain the aimed at results in a short time when compared with the rate of acquisition of the normal child (p. 233).

Requiring an autistic child to attend to the task at hand is a must if progress is to be made. Often this requirement to attend is accomplished by literally taking the child's hands, feet, chin or body part appropriate to the learning task and forcing the child to look, observe, watch and go through the motions of the activity thus teaching him/her new skills kinesthetically. By doing this one can bypass the difficulty the child has in processing visual and auditory information. According to Oppenheim (1974), the teacher must very literally intrude on the child's detachment and avoidance of a task. This intrusion must be unplacable and unrelenting.

The capacity of wind instruments to hold the attention of C, J and T suggests that, as an educational tool, wind instruments could be used effectively as an attention-getting device in lieu of the aforementioned tactics. A wind instrument sound empathetic with a child's ISO sound, and which has the capacity to capture and hold the child's interest, could be usefully employed with autistic children in a teaching methodology known as redundancy. According to Oppenheim (1974), redundancy is the teaching of the same concept in a variety of different ways and, where feasible, using various sensory modalities.

The methodology of redundancy was exploited in the educative level of this study. While auditory stimuli from the instruments held the attention of the children, two-note name themes were played repeatedly and then sung over and over again in an attempt to, 1) evoke an imitative verbal response from the child, 2) and to teach the concept of names i.e., my name, the child's name. To further round out redundacy methodology, a variety of sensory modalites (as suggested by Oppenheim, 1974) were also employed in the study. Visual and tactile modes of sensory stimulation were coupled with auditory stimuli in order to reinforce the impact of the instrument on the child, thus increasing its value as an educational tool.

Repetition of the two-note musical phrase stimuli, coupled with the visual and tactual modalities of sensory stimulation, were successfully employed in the study. The result was valuable therapeutic-educational gains, many of which have already been noted. The significance of these therapeutic-educational gains is that they fall within the basic educational objectives for handicapped children as postulated by Alvin (1965); Bailey (1973); Oppenheim (1974); that a basic objective of education for the handicapped child should be the derivation of some pleasure, enjoyment and satisfaction from his/her world. I am convinced that this objective was met through audition of the wind instruments.

Another educative goal of the study was to increase the child's awareness of cause-and-effect relationships. The approach was to expose the children to a complex stimulus situation. This was done by simultaneously presenting C, J and T with auditory-visual and/or auditory-visual-tactile modalities of sensory information.

Although a study undertaken by Lovaas (see Oppenheim, 1974, p. 38), involving simultaneous presentation of auditory, visual, and tactile cues suggests that autistic children attend to only one stimulus at a time, observational results from this present study suggest that, in some instances, C and J were simultaneously listening to, touching ~~and/or~~ observing the instrument as it was being played. C, with the flute, baritone saxophone, and most notably the tuba, ~~appeared~~ to be listening as she was touching and looking at the instruments. All three of these modes of sensory perception seemed to be functioning simultaneously as C attempted to satisfy her curiosity about the tuba, especially. In communicating her desire to receive both musical sound and vibrational stimuli, J appeared to be attending the auditory stimuli and tactual stimuli simultaneously. T, alone, made no significant attempt to look at the instruments. As well, T, for the exception of one spontaneous move, refused to touch any of the instruments. It appeared to be the auditory stimulus alone that attracted T to the point where she could sit quietly (for her) and attend the musical sounds.

To what degree, if any, there was cognitive awareness of cause-and-effect relationships between 1) myself as performer and the instruments as generators of musical sound, or between 2) the movement (visual) of the keys/valves of ~~the~~ instruments and the movement (auditory) of changing pitches, or between 3) the sound of the instrument and the vibrational stimuli generated on it, remains inconclusive. Observational evidence from the study does, however, offer support for the view that teaching autistic children by employing simultaneous sensory modes of stimulation can produce results. The sensory modalities of stimulation exploited in this study were auditory, playing the instrument for the child; visual, holding the instrument in the child's full foveal view, manipulating the keys/valves within the child's line of sight; tactile, allowing the child to touch the instrument; and kinesthetic, manipulation of the child's hands, fingers and/or arms to hold the instrument, or to press keys/valves. Simultaneous use of these modes of stimulation offer hope as a viable method of teaching autistic children. If employed properly, this methodology could result in significant therapeutic-educational gains for autistic children.

The following conclusions are based on the findings derived from the educative level of the study. These conclusions are:

1) The utilization of wind instruments as educational tools was capable of capturing and holding the interest of C, J and T for periods of time substantially longer than is normally characteristic of them.
2) As educational tools, wind instruments can be used successfully as an attention-getting device and can ameliorate the problem of inattentiveness.
3) Wind instruments can be used as teaching vehicles to help the child experience simultaneous auditory, visual, tactual and other modalities of sensory stimuli.
4) Wind instrument sound as an intangible auditory stimulus, and the wind instrument itself as a tangible object used to provide

visual and tactile stimuli, enabled the following three types of learning activity:

Motoric:

- a) holding the instrument (gross motor)
- b) manipulating the keys/valves (fine motor)

Cognitive:

- a) development of ability to attend/concentrate
- b) development of auditory discrimination

Affective:

- a) enjoyment of interpersonal contact
- b) enjoyment of a wind instrument sound
- c) enjoyment of a wind instrument as a visible, tangible object

Recommendations

The following recommendations, although far from exhaustive, are presented to stimulate and encourage further research endeavor in the fields of music therapy and special music education as they relate to childhood autism.

1) Although research studies in childhood autism are rarely replicated, a replication of this study, utilizing the same methodologies and wind instruments, should be conducted with other autistic children of different age levels, sex, and levels of functioning.

2) Future research studies should attempt to repeat this

study with the purpose of determining the generalizability of the findings to the youth and adult autistic population.

3) A replication of the study should be conducted utilizing the same methodologies but employing other instruments of the brass, woodwind and string families. The following instrumental combinations are suggested:

Woodwinds

a) oboe, bassoon

b) trumpet, trombone

c) French horn, tuba

Strings

a) violin, viola

b) cello, bass

4) A new research study patterned after this study should exploit the sound-rhythm components of the non-melodic percussion instruments (snare drum, bass drum, tympani, cymbals, triangle, tambourine and woodblock) in an attempt to establish a communicative nexus between autistic children and the researcher performing on those instruments.

5) Further investigation should be done to determine what degree, if any, the researcher him/herself influences the response of the child. Investigation should attempt to clarify what effect the presence of the researcher-performer has on the child independent of any stimulus coming from the instrument. Some areas to consider would be:

a) Appearance

- b) Personality
- c) Voice
  - i) articulation
  - ii) inflection
  - iii) tone quality
  - iv) pitch (highness, lowness)

6) Further investigation is needed to determine to what degree the child is responding to modes of sensory stimuli other than the auditory mode. Focus should be on:

Visual Effects
- a) size of the instrument
- b) shape of the instrument
- c) surface of the instrument (color, brightness)

Tactile Effects
- a) instrument surface
- b) vibrations
- c) instrument contour

7) In future studies of this nature, research methodologies should be employed which include, if at all possible, data from teachers and parents. Informative and insightful data can be gathered from the teacher and parents relative to the child who, if non-verbal, cannot provide these data him/herself. This rich data base can serve to uncover socio-historical-environmental and musical sound background material reaching back to the pre-natal period and which may be uncoverable via any other source. As well, teacher and parental

involvement enables them a participatory role and a shared experience in the research endeavor.

8) Research studies of this nature should avoid the use of recordings, tapes and/or other mechanically recorded music. Mechanically reproduced music cannot empathize or coincide with the prevailing sound-rhythm moods of the child. Conversely, improvised music played by a skilled musician-researcher, allows for spontaneous dialogue with the child for each changing mood precisely at the moment of its occurence.

9) Like the present study, further research dealing with music and autistic children should try not to subject the children to the mechanistic and artificial setting of the laboratory where the researcher attempts to selectively control, manipulate or schedule the child and/or his environment. Focus should be more on qualitative methodologies i.e., naturalistic observation studies, field studies, ethnography and the case study. Such qualitative strategies seek to answer questions through observation and participation with children in a setting which is natural to them. Data from these strategies appear in words rather than in numbers, thus allowing for rich, in-depth description and fruitful explanation of processes occurring contextually in a setting both natural and familiar to the child.

Summary

This final chapter has interpreted and/or discussed the data abstracted from the diagnostic, therapeutic, and educative phases of the study. In the diagnostic section, interpretation and discussion of each individual child's responses to the instruments was presented. Discussion of each child relative to the diagnostic level of the study was followed by conclusions and specific recommendations regarding that child. General conclusions finalized presentations relative to the diagnostic level of the study.

The closing sections included interpretation and discussion of the children's responses at the therapeutic and educative levels of the study as well as final recommendations.

The study resulted in many positive and unexpected findings in the search for the potential use of wind instrument sound as a nexus for communication between C, J, T, and myself. Both the serendipitous findings as well as the results that I had hoped for, led me to an even stronger belief that wind instrument sound can be a means of opening up avenues of education for autistic children which will enable them to reach new heights of accomplishment, pleasure and inner satisfaction. The conclusions drawn from the study are the result of observational evidence, descriptive analysis of response and reasoned personal reflection. The strategies employed in the study were grounded on the belief that defining characteristics would emerge from the observational settings themselves and that personal perceptions would yield both valid and accurate interpretations. Taylor (1983, citing Ericson and Ellett, 1982), suggests that although good personal judgment will not yield certainty, it can result in interpretations and analyses far more accurate and powerful than the most skillful application of scientific methods. The recommendations are intended to stimulate and encourage further research in music and autism. It is my hope that as a result of this research endeavor, much enjoyment, pleasure and educational accomplishment may be brought into the lives of autistic children everywhere.

TABLES

TABLE 1

Observable Response Chart Relative to C:

CLARINET

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

	OBSERVABLE RESPONSES													
INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet	H	M L A V					H				M L	H	H M L	X
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Covered ears in high range - also very affectionate towards me. Pushed clarinet away from me. Mother thought C was expressing jealousy.

Name C

Date & Time February 26, 1986, 11:00 a.m.

Location School Observation Room

Instrument Clarinet

TABLE 2

Observable Response Chart Relative to C:

BASS CLARINET

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

	OBSERVABLE RESPONSES													
INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet		M L A V	M L A V	L XX							L F XXX		M L A V	L X A
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Smiles and apparent recognition as I played the Happy Birthday Song. C ceased the activity she was engaged in and gave undivided attention.

XX= Facial expressions indicating enjoyment during Happy Birthday.

XXX= Very receptive to sustained low F, E, Eb.

Name C

Date & Time February 26, 1986, 11:00 a.m.

Location School Observation Room

Instrument Bass Clarinet

TABLE 3

Observable Response Chart Relative to C:

RECORDER

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder						H F	H F			X		H		
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= A high G evoked a guttural sound. Other than this, no apparent interest in the recorder

Name C

Date & Time March 19, 1986, 11:00 a.m.

Location School Sofa Room

Instrument Recorder

TABLE 4

Observable Response Chart Relative to C:

FLUTE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute		H M L A V	H M L A V	H M L		V H M L			A V	M L	H M L		H M L	X
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= C touched the flute, put her finger in the end-hole and then pushed it toward me to have me continue playing. (embraced me, placed her cheek on mine).

Name C
Date & Time March 19, 1986, 11:00 a.m.
Location School Sofa Room
Instrument Flute

TABLE 5

Observable Response Chart Relative to C:

TRUMPET

Code
H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet												X		
Tuba														

Checklist of Initial Observable Responses

COMMENTS:
X= C showed no response to the trumpet.

Name C
Date & Time March 20,1986, 11:00 a.m.
Location School Observation Deck
Instrument Trumpet

TABLE 6

Observable Response Chart Relative to C:

TUBA

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba	F L M	M L P F	M L P F	M L P F				M P			M L H A V			X

Checklist of Initial Observable Responses

COMMENTS:
X= C was visually attracted to the tuba as soon as she saw it. She spent several minutes touching the tuba as well. C did not (would not) look at her own reflection in the mirror-like surface of the tuba.

Name C
Date & Time March 26, 1986, 11:00 a.m.
Location School Observation Deck
Instrument Tuba

TABLE 7

Observable Response Chart Relative to C:

ALTO SAXOPHONE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone				H			H					H		X
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= C did not respond to the alto saxophone other than covering her ears.

Name C

Date & Time April 3, 1986

Location C's home

Instrument Alto Saxophone

TABLE 8

Observable Response Chart Relative to C: BARITONE SAXOPHONE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone		H M L A V	M L A V	M L A V				H M L	H M L	M XX	M L		M L	X
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= C touched the instrument.

XX= C responded to the sound-rhythm of the instrument by initiating sounds she produced on a squeaky door. Also verbalized "I'm Plah" in response to my name theme played and sung repeatedly.

Name C
Date & Time April 3, 1986, 9:00 a.m.
Location C's home
Instrument Baritone Saxophone

TABLE 9

Observable Response Chart Relative to C:

CLARINET (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet												H M L		X
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= C appeared to lose interest as the clarinet sounds followed the bass clarinet sounds.

Name C

Date & Time April 17, 1986, 1:30 p.m.

Location C's School Classroom

Instrument Clarinet (repeat)

TABLE 10

Observable Response Chart Relative to C:

BASS CLARINET (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet		A V	H M L A V	M L A V							M L A V			X
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Frustrating search for source of sound. Darting back and forth throughout room, approaching teacher.

Name C

Date & Time April 17, 1986, 1:30 p.m.

Location C's School Classroom

Instrument Bass Clarinet (repeat)

TABLE 11

Observable Response Chart Relative to C:

TRUMPET (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

	OBSERVABLE RESPONSES													
INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet												XX		X
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= C depressed the valves of the trumpet - had done same with tuba valves earlier in session.

XX= C did not respond to the trumpet sounds.

Name C

Date & Time April 23, 1986, 11:00 a.m.

Location School Sofa Room

Instrument Trumpet (repeat)

TABLE 12

Observable Response Chart Relative to C:

TUBA (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba		M L	M L	XX							M L			X

Checklist of Initial Observable Responses

COMMENTS:
X= C was very moody and unresponsive today. She did feel the tuba with both hands and feet. Tuba sounds seemed to soothe and calm her. XX= With very gentle, refined movement, C placed her foot on one valve and carefully depressed it.

Name C
Date & Time April 23, 1986, 11:00 a.m.
Location School Sofa Room
Instrument Tuba (repeat)

TABLE 13

Composite Observable Response Chart Relative to C

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

	O B S E R V A B L E R E S P O N S E S												
I N S T R U M E N T	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation
Recorder						H F	H F					H	
Flute	H M L A V	H M L A V	H M L			V H M L			A V	M L	H M L		H M L
Clarinet	H	M L A V					H				M L	H	H M L
Bass Clarinet		M L A V	M L A V	L XX							L F XXX		M L A V
Alto Saxophone				H			H					H	
Baritone Saxophone		H M L A V	M L A V	M L A V				H M L	H M L	M	M L		M L
Trumpet													
Tuba	F L M	M L P F	M L P F	M L P F				M P			M L H A V		

TABLE 14

Observable Response Chart Relative to J:

CLARINET

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

	OBSERVABLE RESPONSES													
INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet		M L F		V L F	XX L A			M L		L XXX	M L F P	H F	H M L PFAV	X
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= The "I Love You" (G-E-C) brought gleeful laughter after J heard the theme played and then sung.

XX= On slow melodious playing, in low register, J assumed trance-like posture, eyes fixed upward.

XXX= Imitated four-note night-time sounds.

Name J
Date & Time February 26, 1986, 9:00 a.m.
Location School Sofa Room
Instrument Clarinet

TABLE 15

Observable Response Chart Relative to J:

BASS CLARINET

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet		M L		M L F V	X M L	H M L F V					V M A F L P		V F	XX
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Intense fixation looking upward as I played Bach Chorale.

XX= Pointed to self after much repetition of her name them (played and sung)

Name J

Date & Time February 26, 1986, 9:00 a.m.

Location School Sofa Room

Instrument Bass Clarinet

TABLE 16

Obsrvable Response Chart Relative to J:

RECORDER

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder				H M V	H XX							H	X	
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Hand-flapping.

XX= Eyes glazed - tuning out the sound 'head up' avoidance tactic.

Name J

Date & Time March 19, 1986, 9:00 a.m.

Location School Sofa Room

Instrument Recorder

TABLE 17

Observable Response Chart Relative to J:

FLUTE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute				H M L V	X			V A		L P XX			H M L F V	XXX
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Sensed that J was concentrating on sound - eyes half shut, fixed upward.

XX= One soft guttural two-note vocal response from J to her name theme (played and sung)

XXX= Fascinated with sound and movement of flute keys.

Name J

Date & Time March 19, 1986, 9:00 a.m.

Location School Sofa Room

Instrument Flute

TABLE 18

Observable Response Chart Relative to J:

TRUMPET

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

	OBSERVABLE RESPONSES													
INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet	F			M L F V	M L F						M L V XXX	X	M L F V	XX
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= J rejected touching the trumpet - not the sound of the instrument.

XX= Hand movement (not hand-flapping) indicating she wanted to hear and feel more sound-vibration.

XXX= Very receptive to vibration stimulus as well as sound.

Name J

Date & Time March 26, 1986, 9:00 a.m.

Location School Observation Deck

Instrument Trumpet

TABLE 19

Observable Response Chart Relative to J:

TUBA

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba	M F	M L	M L	F V M L	F M	F M					M L P		H M L V X	XX

Checklist of Initial Observable Responses

COMMENTS:

X= Hand-flapping, rocking

XX= Bursts of laughter, pointing to self at the playing and singing of my name theme (Eb-Bb).

Name J

Date & Time March 26, 1986, 9:00 a.m.

Location School Observation Deck

Instrument Tuba

TABLE 20

Observable Response Chart Relative to J:

ALTO SAXOPHONE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

O B S E R V A B L E   R E S P O N S E S

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone			H M L F A V	A V	X	H M F			XXX		H M A V		H M L F V	XX
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Eyes half shut, focused on me.

XX= Laughter, smiles, vocalization, pulling the instrument to her body.

XXX= Reaching out to touch the instrument (source of sound).

Name J

Date & Time April 11, 1986, 9:00 a.m.

Location School Observation Deck

Instrument Alto Saxophone

TABLE 21

Observable Response Chart Relative to J:

BARITONE SAXOPHONE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES												
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder													
Flute													
Clarinet													
Bass Clarinet													
Alto Saxophone													
Baritone Saxophone		L P A	L P A	M L F V	M L F	M L F					H M L		X	XX
Trumpet													
Tuba													

Checklist of Initial Observable Responses

COMMENTS:

X= Hand-flapping, body animation, rocking.

XX= Guttural vocalizations, laughing, face to face gaze with me..

Name J

Date & Time April 11, 1986, 9:00 a.m.

Location School Observation Deck

Instrument Baritone Saxophone

TABLE 22

Observable Response Chart Relative to J:

ALTO SAXOPHONE (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone		H M P F A V	H M P F A V	H M F V				X			H M L P F A V		H M F V	XX
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Definite awareness of sound in her environment, but no attempt to locate sound other than looking around room from her seat.

XX= Touched instrument, sensed vibrations. Reached out to touch instrument.

Name J

Date & Time May 7, 1986, 10:00 a.m.

Location J's School Classroom

Instrument Alto Saxophone (repeat)

TABLE 23

Composite Observable Response Chart Relative to J

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

	OBSERVABLE RESPONSES												
INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation
Recorder				H M L V	H							H	
Flute				H M L V				V A		L P	H M L		H M L F V
Clarinet		M L H P		V L F	L A			F M L		L	M L F P	H F	H M L PFAV
Bass Clarinet		M L		M L F V	M L	H M L F V					V M A F L P		V F
Alto Saxophone			H M L F A V	A V		H M F					H M A V		H M L F
Baritone Saxophone		L P A	L P A	M L F V	M L F	M L F					H M L		
Trumpet	F			M L F V	M L F						M L V		M L F V
Tuba	M F	M L	M L	F V M L	F M	F M					M L P		H M L V

TABLE 24

Observable Response Chart Relative to T:

CLARINET

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet				H M L							L	H XX F A V	H M L A V	X
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Many grimaces and facial contortions accompanied by clicking of teeth.

XX= Appeared to favor bass clarinet over clarinet.

T was more attentive during bass clarinet audition.

Name T

Date & Time February 26, 1986, 10:00 a.m.

Location School Sofa Room

Instrument Clarinet

TABLE 25

Observable Response Chart Relative to T:

BASS CLARINET

Code
H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet			M L F A V						M L F A V		H M L A V		H M L A V	X
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:
X= T calmed down considerably during audition of bass clarinet. Self-stimulative activity nearly ceased.

Name T
Date & Time February 26, 1986, 10:00 a.m.
Location School Sofa Room
Instrument Bass Clarinet

TABLE 26

Observable Response Chart Relative to T:

RECORDER

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

O B S E R V A B L E   R E S P O N S E S

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder			H M L A V	H M L A V		H M L A V			H M L A V		M L	H	H M L A V	X
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= If calm, T would begin to self-stimulate when I played. If active, T would become calmer with the playing. The sound always had an opposite effect on her present state.

Name T
Date & Time March 19, 1986, 10:00 a.m.
Location School Sofa Room
Instrument Recorder

TABLE 27

Observable Response Chart Relative to T: FLUTE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute				H M L		H		XX			H M L		H M L	X
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= T would withdraw her hands to her chest at each attempt to have her touch the flute.

XX= T was fascinated with the clicking of the keys and responded with squeals of high-pitched laughter.

Name T
Date & Time March 19, 1986, 10:00 a.m.
Location School Sofa Room
Instrument Flute

TABLE 28

Observable Response Chart Relative to T:

TRUMPET

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet		M L A V		M L F A V		F					M L		H M L	X
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Much rocking, facial grimaces, clicking of teeth, baring teeth, and hitting hands on legs. To begin playing again after a short silence brought forth giggles and squeals of delight.

Name T

Date & Time March 26, 1986, 10:00 a.m.

Location School Observation Deck

Instrument Trumpet

TABLE 29

Observable Response Chart Relative to T:

TUBA

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba		M L		M L A V									M L	X

Checklist of Initial Observable Responses

COMMENTS:

X= Squeals of laughter upon playing the tuba. Much hand-flapping, teeth clicking.

Name T

Date & Time March 26, 1986, 10:00 a.m.

Location School Observation Deck

Instrument Tuba

TABLE 30

Observable Response Chart Relative to T:

ALTO SAXOPHONE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone		H M L F P A V	H M L F P A V	H M L F P A V			M P X			X	H M L A V		H M L P F	
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= T covered her ears as I came close to touch her body with the instrument as I was playing.

Name T

Date & Time April 11, 1986, 10:00 a.m.

Location School Observation Deck

Instrument Alto Saxophone

TABLE 31

Observable Response Chart Relative to T:

BARITONE SAXOPHONE

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone				M L F										X
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:
X= Abrupt change of position and behavior from baritone saxophone to alto saxophone.

Name T
Date & Time April 11, 1986, 10:00 a.m.
Location School Observation Room
Instrument Baritone Saxophone

TABLE 32

Observable Response Chart Relative to T:

CLARINET (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet			H M L	H M L				H M L	H M L		M L		H M L	X
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= T laid on her side and sucked her thumb during Brahm's Lullaby and Rock-a-Bye-Baby, and Bach Chorale.

Very excited behavior during faster tempoed music.

Name T
Date & Time April 16, 1986, 11:00 a.m.
Location T's School Classroom
Instrument Clarinet (repeat)

TABLE 33

Observable Response Chart Relative to T:

BASS CLARINET (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet			M L	M L A V				H M L A V	H M L A V	M L	H M L P F		H M L	X
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= Many attempts to vocalize after the playing of T's name theme and then sung by me from behind screen. Many high-pitched squeals of laughter, forced smiles, clicking of teeth. Sucked thumb and laid on her side on the floor during Bach Chorale and Brahm's Lullaby.

Name T

Date & Time April 16, 1986, 11:00 a.m.

Location T's School Classroom

Instrument Bass Clarinet (repeat)

TABLE 34

Observable Response Chart Relative to T:

TRUMPET (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet				M L									M L F	X
Tuba														

Checklist of Initial Observable Responses

COMMENTS:

X= T rejected touching the trumpet. Did not seek out the source of sound as before.

Name T

Date & Time April 23, 1986, 11:00 a.m.

Location T's School Classroom

Instrument Trumpet (repeat)

TABLE 35

Observable Response Chart Relative to T:

TUBA (repeat)

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

OBSERVABLE RESPONSES

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba		M L	M L	M L				M L A V	M L A V		M L		M L	X

Checklist of Initial Observable Responses

COMMENTS:

X= T walked about the room clapping (not hand-flapping) with forced smile on her face and many squeals of laughter and high-pitched vocalizations.

Name T

Date & Time April 23, 1986, 11:00 a.m.

Location T's School Classroom

Instrument Tuba (repeat)

TABLE 36

Composite Observable Response Chart Relative to T

Code
H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation
Recorder			H M L A V	H M L A V		H M L A V			H M L A V		M L	H	H M L A V
Flute				H M L		H					H M L		H M L
Clarinet				H M L							L	H F A V	H M L A V
Bass Clarinet			M L F A V						M L F A V		H M L A V		H M L A V
Alto Saxophone		H M L F P A V	H M L F P A V	H M L F P A V			M P			M	H M L A V		H M L A V
Baritone Saxophone				M L F									
Trumpet		M L A V		M L F A V		F					M L		H M L
Tuba		M L		M L A V									M L

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APPENDIX I

SAMPLE PARENTAL-INTERVIEW QUESTIONS

Sample Parental-Interview Questions

Parent's Name:

Child's Name:

Child's Age:

Child's Date of Birth:

The Child's Past:

Researcher 1. What kind of music or sounds surrounded _____ during pregnancy and immediately after _____'s birth?

Parent(s) A.

R. 2. Do you remember what _____'s first sounds were?

P.

R. 3. Were there voices, sounds or any type of music that surrounded _____ during the first days of his/her life?

P.

R. 4. Can you describe or imitate some of _____'s first sounds?

P.

R. 5. Were there any sounds _____ rejected or seemed to enjoy?

P.

R. 6. Did you ever sing to _____?

P.

R. 7. Did _____ ever seem particularly drawn to music on radio, TV or records? If so, do you recall what kind of music, was it vocal? instrumental?

P.

Present:

R. 1. Does _____ prefer any instrument or instrumental sound now?

P.

R. 2. What is _____'s reaction to music now?

P.

R. 3. If you sing to _____, does he/she respond to the words?

P.

R. 4. Does _____ make any sounds now that resemble a musical pattern? If so, could you sing them to me?

P.

R. 5. Do you have any special form of communicating with _____?

P.

R. 6. Does any other person have any special way (perhaps through music, bodily movements or expression) of communicating with _____?

P.

Parents:

R. 1. Do either of you have any strong musical preference?

P.

R. 2. Do you listen to a lot of music in the home?

P.

R. 3. Did you ever study music? In what way?

P.

R. 4. Do either of you reject or dislike any particular musical or other sound?

P.

R. 5. Is there a strong musical or folkloric affinity with the country of your birth or the country of your parents' birth?

P.

R. 6. Can you suggest anything that might be helpful to me?

P.

APPENDIX II

SAMPLE TEACHER-QUESTIONNAIRE

Sample Teacher-Questionnaire

Researcher 1. How long have you worked with _____?

Teacher A.

R. 2. Does _____ make any sounds?

T.

R. 3. Does _____ appear to enjoy/reject any sounds?

T.

R. 4. Does _____ startle to sudden sounds?

T.

R. 5. Does music of any kind appear to affect _____? How?

T.

R. 6. Does _____ ever attempt to sing or emit sounds of different pitches?

T.

R. 7. Does _____ enjoy playing with things that make noises? What things?

T.

R. 8. Does _____ try to locate the source of sound or music?

T.

R. 9. Has _____ ever tried to imitate music that was present in his/her environment?

T.

R. 10. Are there any stereotypic or compulsive sounds _____ makes? If so, could you imitate or sing them to me?

T.

R. 11. Have you any suggestions which might help me assess the importance and/or influence of music on _____'s life?

T.

APPENDIX III

OBSERVABLE RESPONSE CHART

Code

H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES													
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Reception to Sound	Rejection of Sound	Self-Stimulation	Other
Recorder														
Flute														
Clarinet														
Bass Clarinet														
Alto Saxophone														
Baritone Saxophone														
Trumpet														
Tuba														

Checklist of Initial Observable Responses

COMMENTS: ____________________

Name ____________________

Date & Time ____________________

Location ____________________

Instrument ____________________

APPENDIX IV

COMPOSITE OBSERVABLE RESPONSE CHART

TABLE

Composite Observable Response Chart Relative to

Code
H=High register
M=Medium register
L=Low register
P=Soft
F=Loud
A=Slow
V=Fast
X=see comments

INSTRUMENT	OBSERVABLE RESPONSES												
	Startle Response	Cessation of Activity	Alteration of Activity	Body Movement	Shutting of Eyes	Widening of Eyes	Covering of Ears	Attempt to Locate Sound	Walking Toward Sound	Imitation of Sound	Receptive to Sound	Rejection of Sound	Self-Stimulation
Recorder													
Flute													
Clarinet													
Bass Clarinet													
Alto Saxophone													
Baritone Saxophone													
Trumpet													
Tuba													

APPENDIX V

LETTER TO PARENTS

Dear Parents:

I am currently working on a Ph. D. degree in Secondary Education (Music) at the University of Alberta. After meeting with Mrs Joan McDonald at Grand Valley School to explain the musical testing I wish to do, I am delighted that I have been given permission to use Grand Valley School as a research site.

The purpose of my testing is to use musical instruments (eight of them) as a link to opening up channels of communication with your child. I will play the instruments for your child in an attempt to isolate one instrument that seems to be preferred by him/her. That instrument can then be used both therapeutically and educationally as a link to more direct and open communication. I am asking for your cooperation in granting me permission to work with your child.

The research task will take place twice weekly at the school. I will play the instruments for the children for about twenty minutes. No session should last more than forty-five minutes. A further aspect of the testing is an interview with the parents to learn more of the musical interests, preferences and sounds that your child either accepts or rejects. The interviews will be arranged at your convenience.

If you are willing to let your child participate in the research project, please sign the consent form below and return it to Grand Valley School. Thank you for your cooperation.

Respectfully,

Paul D. Hoelzley

I am willing to participate and will allow ____________________ to participate in the doctoral research at Grand Valley School.

Signature ___________________________________ Date __________________

APPENDIX VI

LETTER TO THE SCHOOL

To the Director
Grand Valley School
1048 Hollywood N. E.
Edmonton, AB

TO WHOM IT MAY CONCERN:

I am currently working on the Ph. D. degree in Secondary Education (Music) at the University of Alberta. I would very much like to do some testing at Grand Valley School. Mrs Joan McDonald and I have discussed the research project in detail and she has assured me that the musical testing I wish to do at Grand Valley School would be most welcome.

The purpose of my testing is to use musical instruments (eight of them) as a link to opening up channels of communication with autistic children. The testing would involve my playing the instruments for the children until one instrument is found, the sound of which seems to be preferred by the child. That instrument can then be used both therapeutically and educationally as a link to more direct and open communication with the child(ren).

Sessions with the children would be twice weekly and would last about forty-five minutes. I would play for each child participating in the research project individually. Parents and/or teachers would be welcome to observe.

I trust that you will give the request your every consideration and that you will grant me permission to carry out this musical research project at Grand Valley School.

Respectfully,

Paul D. Hoelzley

APPENDIX VII

PARENT-TEACHER RESPONSES

Parent-Teacher Responses

Teacher: T has certainly taken to you. She feels right at home. She is so affectionate.

Teacher: T seems to enjoy the music. It is unusual for her to sit so long.

Teacher: T is certainly aware of the (saxophone) sound in her environment. She's going to look for it (the source of the sound) until she finds it.

Teacher: It (the musical sound) seems to excite her (T).

Parent: I was hoping she (C) would like the flute but she sure seems to be interested more in the tuba. She listened to it for all that time.

Parent: C may appear to you that she is not listening as she wanders in the room but I can tell that she is really interested in what you are doing (on the bass clarinet). She is listening.

Parent: "Wow." She (C) went right to you and gave you a hug. That is amazing.

Parent: C really responded to the bass clarinet. There was a definite change (from the clarinet) in her behavior. She really listened to the low notes.

Parent: C was really interested in pushing the keys (on the clarinet). She seemed to like the vibrations when you put the clarinet on her stomach.

Parent: I saw that C became jealous of the instrument and wanted it out of the way. She wanted your full attention.

Parent: Quite a way you have with her (C). She likes to come to you for a hug and hugs you back.

Parent: I am very pleased with her (C's) interest. To hold her attention for so long is most unusual (baritone saxophone). To sit there and listen for so long, I can tell that she is listening.

Parent: Even though she (C) is not looking at you, she is definitely listening, I can tell (flute).

Teacher: There was a definite interest when you changed (from clarinet) to the bass clarinet. You are going to find some interesting things.

Teacher: C was certainly aware of the musical sounds. She didn't know where the sound was coming from, though. She kept coming to me as if she thought I might be making the sounds.

Parent: (After playing on the flute, and singing C's name theme). She really wants to respond. She seems to be fascinated with the word 'Paul.' She really wants to respond. I can tell she wants to but is frustrated because she can't.

Parent: That was amazing. It (C's response to her name theme played on the flute and then sung) sounded like a direct imitation.

Parent: She's (C) quite moody today. I don't know what I'm going to do with her. (Later) Even though she was moody, she was very interested in the tuba. She seemed to quiet down when you played.

Parent: Her (C) concentration and attention is so unusual. She's been here listening for forty-five minutes (bass clarinet).

Parent: She's (C) been waiting for you. She seems to be anxious to come in.

Parent: C is sure interested in the tuba. She just wanted to touch it and listen to it. She put her head way inside while you were playing.

Parent: C came back into the room on her own when you started playing the tuba again (after C left the room and went to her mother who was watching through a window in the hallway).

Parent: I think she knows what you're here for. She wants you to get the instruments out (as I talked to C's mother in the living room of their home with instruments in cases on the floor).

Parent: C does not seem to like high sounds. Maybe that's why she seemed to dislike the instruments (recorder, high register of clarinet and alto saxophone).

Parent: I wonder if she was really trying to make her own music to copy you (after C went to her bedroom and began playing with a musical toy as I played nursery rhymes on the baritone saxophone).

Parent: C, you are sure full of surprises. She really said it very clearly (after C responded verbally to my name theme played on baritone saxophone and then sung, by saying, "I'm Plah").

Teacher: She (J) seems very anxious to go with you. She's ready for her music session. She wants to hear some more of the instruments.

Teacher: J is certainly aware of the sound. She is wondering where it comes from. She seems to be looking to me for an answer. The other children don't seem to bother her. She's interested in the music.

Teacher: J sure likes you and wants to be with you.

NOTE: The comments reported above are paraphrased statements.

APPENDIX VIII

OBSERVATION SCHEDULE SHEET

Observation Schedule Sheet

Name	Date	Place
J, T	February 12, 1986	School
J, T	February 17, 1986	Home
C	February 19, 1986	Home
J, T	February 19, 1986	School
C, J, T	February 26, 1986	School
C, J, T	March 19, 1986	School
C, J, T	March 26, 1986	School
C	April 3, 1986	Home
J	April 11, 1986	School
T	April 16, 1986	School
C	April 17, 1986	School
C	April 23, 1986	School
J, T	May 7, 1986	School

Intermittent visits were made to the school to briefly observe the girls, between February 12 and May 21, 1986.